DESCRIPTIVE CATALOGUE

SIAM TURIN
•1911•

OF SIAMESE EXHIBITS

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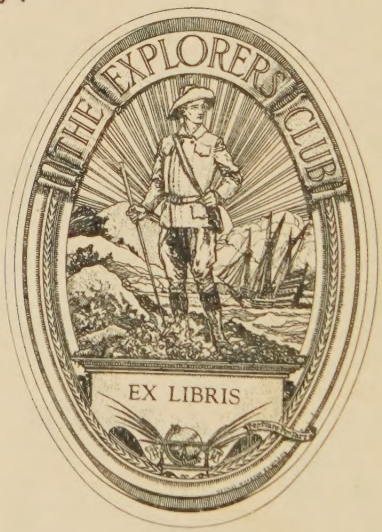

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Siam and its Productions, Arts, and Manufactures

A Descriptive Catalogue

of the

Siamese Section

at the

International Exhibition of Industry and Labour
held in Turin April 29—November 19, 1911

Supplemented with historical, technical, commercial, and statistical summaries on each subject

Compiled by

Colonel G. E. GERINI, M.R.A.S.

Commissioner-General of H.M. the King of Siam to the Turin and Rome International Exhibitions, 1911

With contributions from several specialist writers, and illustrated with numerous plates, a specially designed map of Siam in colours, a plan, and a trichromic picture of the Siamese Pavilion

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English Edition

revised and brought up to date, with the addition of an Appendix on the results of the Siam Exhibition at Turin

1912

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Preface to the Italian Edition of 1911

(Translation)

THERE has hitherto existed in Europe only an imperfect knowledge of Siam, her natural resources and productions, as well as of the remarkable progress she has made during the last fifty years, the new thoroughfares she has thrown open to industry and commerce, and the facilities and possibilities for trade created. The few books so far published on the country do not materially promote a closer acquaintance, even when they are not positively misleading. They are, as a rule, but the outcome of superficial observations made by tourists during the course of a few days' stay in the land, or else carried out for a longer period by persons who had not the opportunity of entering into a full inquiry.

Thus it happens that one vainly searches the extant publications for detailed information on the present arts and industries of the Siamese, and still less successfully for historical hints on their rise and past development. Abstruse subjects are these indeed, which, even to foreign residents who have lived in the country for many years have remained for the most part a sealed book. Besides some dry-as-dust statistical reports, little of really noteworthy literature has so far appeared on the trade and land produce.

In order to supply in some measure such lamentable wants it seemed useful to preface to the list of exhibits

in each group some brief notes summarizing the most important information available — whether technical or statistical and in some cases even historical — on the industries and products of that particular group itself. From the fact of such notes having been compiled, on the basis of the most reliable data, by writers who, either by reason of the official position they hold or as a result of their own particular researches, have acquired a fairly good grasp of the subject they dealt with, it seems reasonable to hope that their short essays will prove useful. At the same time it is highly desirable that a more thorough treatment of these important subjects should as soon as possible see the light, embracing also those industries and products which in the present summaries could not be included, for the obvious reason that they were not represented in the Show.

For a general description of the country and its institutions the reader may be referred with advantage to the book *The Kingdom of Siam*, which was officially published on the occasion of the Louisiana Purchase Exposition, St. Louis, 1904. While the present volume completes that one in the sense that it supplies more extensive and detailed information on the products, industries, and trade of Siam, reporting moreover the most recent data available, it might be well not to forget that it makes no pretension to any higher standing than that of a mere descriptive Catalogue of the present Show. As such it could not exceed the limits of bulk imposed upon publications of this character.

The best handbook of general information on the products of Siam is the present Show, open to all while the Turin Exhibition lasts. Accordingly, the opportunity should not be missed of paying it a visit, and, in the case of those who are either business men or manufacturers, of carefully studying the particular features of it that

interest them, availing themselves, if they so prefer, of the guidance of this booklet. But above all, let one pay a visit to the Show; these pages do not profess to be more than a rudimentary commentary on it, and can only inadequately reflect its attractiveness and importance.

G. E. Gerini.

Turin.
July, 1911.

Garuḍa, the mythical king of birds (side view).

Prefatory Note to the present Edition

THE present edition (in English) of this Catalogue is a translation of the preceding Italian one only in so far as the articles from the Editor's pen are concerned. The others are given in the original English in which they have been written by their respective authors, instead of in translations from that language as in the Italian edition, except those which, as mentioned in each particular instance, have been translated by the Editor from the Siamese language.

In many respects the present edition is a revised and enlarged one, and may on this score be considered an improvement upon its Italian prototype. Among other things half a dozen full-page plates have been added, reproducing photographically some of the show-cases, with the respective exhibits, as they stood on view in the Siam Pavilion. It has been furthermore deemed expedient to supply this issue with a more thorough Index of Subjects, as well as with an Appendix embodying the results of the Siam Exhibition at Turin. Thanks to the last-named addition the present booklet now offers in complete form the narrative of the participation of Siam in the Turin International Exhibition from its inception to the very end, and will remain as a standing memento of Siam's industry, activity, and success in connexion with that happy event. There can be no doubt that the brilliant results she has achieved in this International competition, which have procured her the highest praise and congratulations from all quarters, will further encourage her to participate in future events of the kind and gallantly strive for ever-increasing success. Excelsior!

G. E. G.

TURIN.
December, 1911.

Round panel with figures of celestial nymphs.

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p. 53, at bottom of article. Add the subscription : G. E. Gerini.
p. 61, l. 10 from bottom. *For* of King *read* of the King.
p. 132, No. 361*a*, *b* of table. For *spuria* read *sp.*
p. 132, No. 377 of table. For *Tum* ,, read *Tum ?*
p. 147, l. 8 from bottom. For *Gossipium* read *Gossypium.*
p. 189, l. 3. For *lōt* (*Simplocos* read *lôt* (*Symplocos.*
p. 194. l. 2 from bottom. For *chalūt* read *c'halūt.*
p. 195, l. 7. For *wānn* read *wān.*
p. 207, after No. 608 of table add : 608*a* Berli (A.) & Co. — Piece of Siam gutta-percha.
p. 221, No. 682 of table. For *Musa silvestre* read wild *Musa.*
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INTRODUCTION

The first Siamese Embassy to Italy. Audience accorded by Pope Innocent XI to three Siamese Envoys in Rome on December 23, 1688.

Reproduction from a print of the period (see p. xxvii below).

INTRODUCTION

I

Siam and Italy

An Historical Retrospect

IT is neither recently nor a few centuries' ago that amicable relations were established between Italy and Siam; they date as far back as the glorious days of ancient Rome, whose commerce reached, perhaps even before the restoration by Cæsar Augustus of the imperial power, the *Aurea Chersonesus* (namely, the Siamo-Malay Peninsula), soon afterwards extending to the Gulf of Siam, in order to attain, by the traditional sea-route terminating at *Cattigara*, the land of the *Seres*, then as yet almost legendary.

Thus, while the near Orient, trodden by the Roman legions, was dispatching embassies to convey tribute and homage, it is an imperishable glory of Rome and withal an index of her universal prestige at that period that as the Latin bards of the golden era sang—the Far East, fascinated by the irresistible influence of the eternal *Urbs*, should feel induced to establish relations with it and to seek commercial intercourse. Thus it came to pass that from that remote period there began to be exported to the West, from the coasts of Siam and the Golden Khersonese, turtle shell, scented gums, and valuable spices and perfumes, among which perhaps the balsamic benzoin. And the name of Rome and her greatness, which filled the universe, expression of civil and political ideal, reverberated

to those Far Eastern lands, where it has remained to the present day indelibly imprinted in the local traditions.[1] For, despite the many vicissitudes which upset Italy in the West and Siam in the East—which latter had also to suffer barbaric invasions and fierce wars, and often had to fight to safeguard its independence—never was the name of Rome there forgotten, nor did it ever lose its charm among those folks. Towards this end, it is true, contributed also the daring exploits of the mediaeval Italian travellers, who, from the free communities and flourishing republics which then formed the glory of Italy and set the example of civil government, commerce, and industry to the world, proceeded boldly to those far-away lands, to maintain there unfading the name of Rome, and with it that of Italy, the *alma parens*. Thus towards the close of the thirteenth century the Venetian Marco Polo, sailing from Southern China along the coast of Champā (now part of Annam and of French Indo-China), reached the Gulf of Siam and landed at *Locat* or *Loncat* (the present *Nonchit* or *Nōng-chik* in the Ligor province), on the west coast of the same gulf.[2] And he put on record the gold and other valuable produce which then, as nowadays, formed the object of trade in that territory.[3]

Next to great Marco, in order of time and fame, comes a fellow-citizen of his, Nicolò Conti, who in about 1430 (first among Europeans) visited Tenasserim, then a province of Siam.

[1] In the forms *Rôm* or *Rôm-visai* (from the Sanskrit *Roma-risaya*, that is to say, 'Roman region' or 'Roman Empire') which recur in the old legends and literature of Siam.

[2] For the identification of *Locat* or *Loncat* with *Legeh* or *Langèh*, but, more probably, with the neighbouring *Nechi*, *Nonchit*, or *Nōng-chik*, see the discussion made by the writer in his book, *Researches on Ptolemy's Geography of Eastern Asia*, London, 1909, pp. 497 and 815. See also p. 173 below.

[3] After having passed the islands *Sondur* and *Condur* (*Sodarā*, i.e. 'The Brothers', and Pulo Condor) and sailed 500 miles further in a south-western direction, Marco Polo came to 'another country which is called *Locac* [var. lect. *Lochac*, *Loncat*]. It is a good country and a rich; [it is on the mainland]; and it has a king of its own . . . In this country the brazil which we make use of grows in great plenty; and they also have gold in incredible quantity. They have elephants likewise, and much game. In this kingdom too are gathered all the porcelain shells which are used for small change in all those regions . . . ' (Yule's *Marco Polo*, 3rd ed., vol. ii, p. 276, London, 1903).

landing probably at Mergui, where he noticed elephants and sapan-wood in plenty.[1]

Barthema of Bologna also called in 1505 at the same seaport and other places on the Siamese coast, of which he left lengthy descriptions.[2] Later on news reached him of the city of *Sarnau* (*Sanô* or Ayuddhyā, the capital of Siam at that period), whence there were exported silk fabrics, scented and dye-woods, musk, and benzoin, with the excellence and perfume of which last he was struck with admiration.[3]

All this received confirmation in 1514 by Giovanni da Empoli from the same quarters, whence he wrote stating that at *Tannazzarim* (Tenasserim) and *Sarnau* the finest white benzoin is produced, besides storax and lac far superior to that of Martaban.[4]

In 1522 Antonio Pigafetta, of Vicenza, while on a visit to Timor, heard and took note of *Odia* (Ayuddhyā), the capital of Siam[5]; and in 1568 Cesare dei Federici, a Venetian, while sailing from Malacca to Pegu, and after a vain attempt to land at Mergui, collected on board information on Tenasserim and Siam.[6]

[1] 'Having departed from the island Taprobana [v.l. Sumatra] he arrived, after a stormy passage of sixteen days, at the city of Ternassari, which is situated on the mouth of a river of the same name. This district abounds in elephants and *verzin* [v.l. sapan-wood]' (from Nic. Conti in Poggio's *De varietate Fortuna*, lib. iv).

[2] See Ramusio's *Delle Navigationi et Viaggi*, vol. i, fols. 164–5, Venetia, 1563.

[3] 'We met likewise here with some Christian merchants who said they were from a city called *Sarnau*; they had brought for sale silken stuffs, aloes-wood [v.l. eagle-wood], *verzin* [sapan-wood], and musk' (from Ramusio, op. cit., fol. 165 recto).

'. . . There are three sorts of aloes-wood. The first and most perfect sort is called *Calampat* (Calambac), which . . . comes from a [city] named *Sarnau* . . . and is worth in *Sarnau* ten ducats a pound' (op. cit., fol. 166 verso).

'. . . he took as much *belzui* [benjoin, benzoin] as the size of a walnut, and then of that which grows in *Sarnau* about half a pound, and caused it to be placed in two separate rooms in burners with fire therein. I tell you in truth that even so little a quantity of it made more perfume and more suavity and sweetness than would be obtained from two pounds of other sorts [of it]' (op. cit., fol. 167 recto).

[4] See the letter of Gio. da Empoli in the *Archivio Storico Italiano*, Appendix No. 13, p. 80, Florence, 1846.

[5] '*Odia*, where is the city inhabited by the king of *Siam*, who is named *Siri Zacabedera*' (Ramusio, op. cit., fol. 369 recto).

[6] '*Tenasari* which is a town in the region of the kingdom of *Sion*, situated inland . . . on a large river . And where the river enters the sea

History, however, records something more than these short stays on Siamese territory and passing remarks on it by Italian merchants and travellers. And it affords particular pleasure to recall, in this capital of Piedmont and on the occasion of the highly auspicious anniversary now being celebrated in it, how there was no lack, among the sons of this district, of those who gave proof in Siam of that hardihood and tenacity which ever characterized them and commanded universal admiration.

Foremost among these was the Jesuit father Giovan Maria Leria, a Piedmontese,[1] who, having succeeded in 1642, after some months' sojourn in Siam, in reaching, by way of Kamboja, the country of the Eastern Lāu people, settled down in its capital Wīeng Chan, soon making himself there so popular and agreeable to that Prince that he did not hesitate to entrust him with repeated embassies to the Court of Annam. It was in order to fulfil such missions that Leria (the first of Europeans to do so) crossed in December, 1646, the mountain range which separates the Mē-Khōng valley from the Annamese watershed, and three times again during the two years following. He

there is a village called *Mergi*, in the harbour of which every year several ships are laden with *verzin* [sapan-wood], *nipa* [wine from the *Nipa fructicans* palm], benzoin, and some cloves, maces, nutmegs . . .' (from Ramusio, op. cit., vol. iii, ed. 1607, f. 327 verso).

[1] Born at Vercelli in 1597, he began his novitiate in August, 1616. Left Italy, arriving in Annam (Hwē) in 1622. Expelled thence with the other missionaries in 1639, he proceeded to the neighbouring Kamboja, whence he went over to Siam (1640). After a vain attempt to reach Lāos from that quarter, he returned to Kamboja (1641), whence finally, proceeding up the Mē-Khōng in April, 1642, he entered Lāos. In December, 1646, he travelled overland from the Mē-Khōng to Ngē-ān, and thence to Tongking, returning by the same way in 1647. Towards the close of 1648 he for the third time crossed the Lāu–Annamese watershed, travelling on to Tongking. The war which had meanwhile broken out between Cochin-China and Lāos prevented him from returning to the last-named country, so he went on to Kamboja, where he vainly awaited till June, 1659, for an opportunity to accomplish his design. Old age and ailments brought about by past fatigues compelled him at last to give up the undertaking, so he proceeded to Siam, remaining attached to that mission till about the beginning of 1665. Failing health having then brought him to Macao, he ended his days there on August 21 of the same year.

See on these travels of Leria, G. F. de' Marini's *Delle Missioni dei Padri della Compagnia di Gesù*, Roma, 1663, pp. 498-500 and 536-9. But avoid the better-known spurious translation of this work published by F. Lecomte (*Relation nouvelle des Royaumes de Tonquin et de Laos*, Paris, 1666), where the name of Leria is not even cursorily mentioned, thus misleading several writers into ascribing the description of Lāos to information collected on the spot by Marini himself.

was thus favoured with far greater success than his predecessor, Father Bonelli, a Sicilian, who in 1637 had attempted that difficult journey in a reverse direction from Tongking, but overtaken by malarial fever met his death just when he had reached the frontier of the Lāu Country—like Moses in sight of the Promised Land.

The name of Leria well deserves to be rescued from the oblivion which enshrouds it on account of the memorable achievements just alluded to, which could not be renewed till a few years ago by daring French travellers, who retraced the way of communication between Lāos and Annam which had already been trodden 240 years before by the Italian pioneer.[1] It seems thus not only befitting but right that Piedmont should commit the memory of Leria to posterity in some permanent manner. Among the early Italian missionaries who visited Siam, also worthy of mention is Father Marini of Taggia, who, having landed on November 29, 1642, at Mergui, proceeded thence overland through the Siamo-Malay Peninsula to P'hejburī and next to Ayuddhyā. This he reached on or about February 15, 1643, residing there for some time.[2]

But none rose in Siam to such popularity and distinction, for his remarkable attainments, as Father Thomas Valguarnera, a Sicilian, who in 1655 had been sent thither from Macao, as Superior of the but recently re-established Ayuddhyā mission.

He was a many-sided man. Mathematician, astronomer, mechanic, engineer, and philologist, he soon became so popular among both natives and foreigners as to be by all of them familiarly spoken of simply as 'Father Thomas'. He fortified the capital and the Royal Palace, embellishing, moreover, the

[1] A careful study of Leria's itinerary from Lāos to Annam led me to the conclusion that he followed on the whole the same route which was rediscovered by Auguste Pavie in March, 1889, crossing the watershed at the Hop Ham or Top Mang pass leading by way of Hā Trai on to Viñ (Vinh). Leria was anyhow the first European to cross the range separating the Mē-Khōng valley from Annam. The attempt was not renewed till February, 1877, by Dr. Harmand —and then at a point much farther south—who crossed the ridge at a depression between the basin of the Sē Bāng-Hīen and Cam-lō.

[2] See Marini, op. cit., pp. 408-9. Marini reached Tongking in 1647, founding a missionary residency at Kē-hā. It is therefore likely that he tarried in Ayuddhyā several years.

latter with playing jets of water-fountains, thus anticipating the achievements of those Italian engineers and architects who during the last forty years have erected so many handsome buildings and works of art in the country.[1] Nor was the enlightened work of Father Valguarnera limited to this. His determination, for instance, of the geographic co-ordinates of Ayuddhyā came to be adopted by his contemporary scientists and held the field for thirty years, that is, till it could be slightly emended by the celebrated Jesuit astronomers and mathematicians who arrived in Siam in 1685, with the aid of improved instruments and the observation of a lunar eclipse.[2]

[1] Tavernier wrote of him as follows: 'In the year 1665 there was in the town of *Siam* [v.l. Ayuddhyā] a Neapolitan Jesuit called Father *Thomas* [N.B. Marini, op. cit., p. 410, says he was a Sicilian]. He fortified the town and the King's palace, which is on the margin of the river, and he had previously erected good bastions on both sides. It was on account of this that the King allowed him to dwell in the town, where he had a small church with a house where M. *Lambert*, Bishop of *Beyrout*, went to lodge on arriving in Siam [August 22, 1662]. But these two did not long remain on good terms together, and the Bishop found it advisable to have a separate chapel' (Ball's Tavernier, vol. ii, pp. 295-6, London, 1889). The last sentences explain how in the published travels of the Bishop of Berythos and his colleagues not a word is breathed of Father Thomas, from whom they must have received valuable assistance at the initial stage of their mission, for the success of which, however, they prefer to ascribe to themselves all the kudos.

Marini thus refers to the ornamental fountain erected by Father Thomas: 'The Captain [of a Portuguese vessel from Macao] . . . having presented to the King a painting on canvas representing a fountain with a delightful play of waters, the King was so pleased with it that he enquired whether anyone would feel capable of transferring into reality what appeared in the picture and carry out the work in accordance therewith. Thereupon the Father replied he would undertake himself the task, out of homage to His Majesty. And so well did he execute the work that the King expressed satisfaction, and in reward thereof promised the Father to have a house built for him, as soon as the Kingdom would no longer need to make warlike preparations' (op. cit., p. 418).

Another Italian distinguished himself some years later in building an aqueduct for the supply of drinking water to the ornamental fountains and country mansion which King Nārāī had had erected for himself at Lop'hburī. This has been put on record by the missionary Gervaise, who resided in Siam from 1681 to 1685, and who wrote as follows of the Lop'hburī palace: 'À la gauche il y a un grand reservoir qui donne de l'eau à tout le Palais, il est l'ouvrage d'un François & d'un Italien plus heureux & plus sçavants dans l'Hydrolique, que plusieurs Étrangers qui y avaient travaillé avec les plus habiles Siamois pendant dix années entières sans avoir pû jamais en venir à bout' (*Histoire naturelle et politique du royaume de Siam*, Paris, 1688).

Vestiges of such works, as well as of the aqueduct which brought water from afar, are yet visible at Lop'hburī.

[2] Notwithstanding this, La Loubère, who visited Siam in 1687, still states the position of Ayuddhyā, 'according to Father Thomas the Jesuit,' to be 14° 20′ 40″

Moreover, so thorough a mastery did he acquire over the Siamese language during his lengthy residence in the country, that the king (Nārāi) availed himself of his services as interpreter and translator in his relations with foreigners. He compiled furthermore a dictionary of the language—which it would be interesting to ferret out—and thus he was also in this respect a pioneer.[1] Such a favourite had he become with the king for his multifarious services, that when his little church and house were destroyed by fire in 1658 the king granted him a new site, far more extensive, within the precincts of the town itself, so that he might re-erect more commodious buildings. Thus it came to pass that Valguarnera was the only European allowed to dwell in the city itself, all other foreigners having to reside in the suburbs.[2] Instead of barren attempts at obtaining spiritual conversions of doubtful sincerity and social advantage, he set himself to spread Italian civilization and arts throughout Siam, thus benefiting the country as well as the foreigners—whether traders or missionaries—who came thither. Hence his immense popularity, which no other missionary in those parts ever rivalled. All this paved the way

N. lat. and 120° 30′ long. E. from Ferro Is. (see De La Loubère's *Historical Relation of the Kingdom of Siam*, London, 1693, p. 6).

The Jesuit astronomers, on the basis of their observation of the lunar eclipse of December 11, 1685, at Lop'hburī, had been led to rectify the longitude of Ayuddhyā into 121° E. Ferro (= 102° 50′ E. of Greenwich), which is even more erroneous than that of Father Thomas. Tachard (in his *Second Voyage de Siam*, Amsterdam, 1689, p. 131) states, nevertheless, that the latitude Father Thomas found for Ayuddhyā was 14° 18′ N., which he appears to accept as correct.

The true data for Ayuddhyā are about lat. 14° 22′ N. and long. 100° 35′ E. of Greenwich.

[1] See Marini, op. cit., p. 405: 'Father Thomas Valguarnera, who was engaged [in 1660] in compiling a Dictionary, or Vocabulary, of that Siamese language which he knows to perfection. . . . And the King of Siam makes use of him as interpreter for the letters he receives from foreigners.'

[2] Cf. Tavernier and Marini in the passages quoted above (p. xxiv). Marini further adds, at p. 411 of his book, that Valguarnera built himself the new church 'with stone of which, there being none in and about the town, a shipload was sent him from Macao. The façade boasts of so graceful an architecture—it being customary in the country to make such structures very attractive, painted and gilt—that even the Gentiles are enraptured with it'. This gives an idea of the architectural talent of the Father. It was in such new residence that he welcomed La Mothe-Lambert, the Bishop of Berythos, upon the arrival of the latter at Ayuddhyā on August 22, 1662 (see p. xxiv above, n. 1).

to the success of the early delegates of the Société des Missions Étrangères, which had then just been founded in Paris (1663), as well as to the establishment of direct diplomatic relations between Siam and Europe.

On August 24, 1669, Pope Clement IX wrote a letter to the King of Siam, entrusting it to François Pallu (Bishop of Heliopolis and one of the founders of that missionary society), who delivered it to the King in Ayuddhyā in September, 1673, during a solemn audience, together with another letter from Louis XIV.[1]

In reply to such overtures King Nārāi sent, towards the end of 1680, an embassy which, besides proceeding to France, was also to call at Rome in order to deliver to the Pope a letter and bountiful presents of valuable productions of the country, which included two young elephants. But the ship that conveyed the envoys foundered on the east coast of Madagascar, and everything was lost, together with the lives of the passengers.[2]

When informed of the disaster King Nārāi ordered an arm-chair to be made of *nāk* or red gold, similar to the one he used himself for ordinary audiences, with a view to sending it as a present to the Pope at the first opportunity,[3] and on December 22, 1687, wrote him a new letter which he entrusted to a small embassy consisting of three Siamese dignitaries and put under the guidance of the Jesuit Father Tachard. This was the first Siamese diplomatic mission to appear in Italy. From France, where it had landed, it proceeded by sea to Genoa, whence it travelled overland to Leghorn. Thence it sailed to Civitavecchia, and finally reached Rome on December 21, 1688. Here it was twice received in solemn audience by the Pope Innocent XI, namely, on the 23rd of the same month and on

[1] See Lanier's *Relations de la France et du Royaume de Siam*, Versailles, 1883, pp. 15-17.

[2] Op. cit., p. 26.

[3] Thus states the Abbé de Choisi in his *Journal du Voyage de Siam*, p. 354, Trevoux, 1741. On p. 313 of the same book he informs us how, in a particular audience that King Nārāi granted to M. de Chaumont on November 19, 1685, 'Sa Majesté était dans un fauteuil de tambaque.' It does not appear whether the similar arm-chair the king had ordered to be made for the Pope ever reached its destination. On tambac or *nāk*, see p. 233 below.

January 4, 1689.[1] A tangible record of that first audience exists in a print of the period, still preserved by Prince Ladislaos Odescalchi, the present descendant of that Pope.[2]

Meanwhile in 1680 the congregation of Propaganda Fide had sent out to China five Italian Franciscan missionaries, who after a lengthy journey, partly overland and partly by ship, reached Siam in December, 1682. Here they tarried for over one year, chiefly at Lop'hburī, whence one of them, Father Gio. Francesco Nicolai of Leonessa, wrote a most interesting letter to his brother Cristoforo in Rome, describing not only their journey from Italy to Siam, but also the city and the Royal Palace, where they were several times affably received in audience by King Nārāi.[3] Leaving two of their brethren in Siam as missionaries, the rest of the party resumed their journey, finally reaching Canton on or about August 28, 1684.

After an abrupt interruption of intercourse caused by the troubled state of Siam in 1688, an Italian is resorted to as an intermediary to re-establish amicable relations with the West. This was Father Nicola Cima, an Augustinian friar who, in 1703, while on his return journey from China to Italy,

[1] See Tachard's *Second Voyage de Siam*, Amsterdam, 1689, pp. 344-69. The Siamese embassy left Rome on January 7, embarking at Civitavecchia, whence it returned to France.

[2] This print bears the heading: 'Audience granted by our Lord Innocent XI to Father Guy Tachard, Soc. Jesus, and to the three gentlemen Mandarins sent [as envoys] to His Holiness by the King of Siam, on the 23rd December, 1688.' On the lower right-hand corner is the wording: 'Aristides V. Westerhout, Flemish, delineated, engraved, and printed in Rome, and from the same they are sold in Parione, Anno 1689, with licence.'

A photographic reproduction of this print is on view in the Central Hall of the present Siamese Pavilion, and it is shown in a reduced size on p. xviii above.

In the Pavilion may be seen also another Siamo-Italian print, consisting of a plan of Ayuddhyā and of the river course below this down to Bāngkōk (then as yet a mere fortified village). This plan, drawn up by the celebrated Venetian cosmographer Coronelli, is dated A.D. 1666.

[3] This lengthy letter (eight pages in 4to MS.), now in my possession, is dated from 'Louó [*Lavô*, i.e. Lop'hburī] in the Kingdom of Siam, the 24th December, 1682'. It is so far inedited, and has even escaped the attention of Father Marcellino da Civezza, who, though mentioning other letters from Father Nicolai in his *Saggio di Bibliografia Sanfrancescana* (Prato, 1879, pp. 314-15), breathes no word of this one.

Nicolai was elected afterwards (1697) Bishop of Berythos and Vicar Apostolic of Hu-kwang in China. Returning later to Rome he was promoted to be Archbishop and Vicar of the chapter of St. Peter, in which office he ended his days there.

happened to call at Siam.[1] Here he was provided with a passport from King Sūriyendr (Siam's Nero, hence nicknamed the 'Tiger King'), who had then just ascended the throne, and sent in September of that year with proposals of amity to the French Governor of Pondichery and to the Court of France.[2]

Meanwhile, in July, 1695, Dr. Gemelli Careri, of Naples, while sailing through the Gulf of Siam, took note of various information he had been gathering on that State, particularly of the considerable demand for Siamese elephants in Tenasserim, whence they were shipped to the Coromandel coast.[3]

The wars which raged immediately after the middle of the eighteenth century and lasted for nearly fifty years cut off once again the diplomatic relations of Siam with Europe, and it was not till after 1820 that it became possible to gradually resume them. During the forty years which followed, treaties of friendship and commerce were concluded with the foremost nations of the world, the Siamese seaports being thereby thrown open to free trade. In 1868 came the turn of Italy, which, having arisen united and independent, longed for a greater extension of her trans-oceanic commerce, especially in view of the impending completion of the Suez Canal, which would greatly shorten the sea-route to the Far East. Accordingly negotiations were opened that year in London between the plenipotentiaries appointed respectively by Italy and Siam, and a scheme of treaty was drafted up. Owing, however, to a certain new clause which Italy desired to insert therein, but which had no precedent in the treaties between Siam and other Powers, and upon which Siam desired to be further enlightened, it was found impossible to arrive for the moment at a conclusion.

Under such circumstances an envoy was sent by Italy to Siam in the person of Comm. Carlo Racchia, who arrived there on December 21, 1870 — a fateful year — on the corvette *Principessa Clotilde*. He was the first Italian diplomat to

[1] Father Cima had gone out as missionary to China in 1697.

[2] See Launer, op. cit., p. 193.

[3] See the English translation of his *Voyage round the World*, in Churchill's Collection, 1703, pp. 282-4.

[4] The negotiations suffered moreover a delay owing to the demise of the King of Siam, Mongkut, which took place on October 1, 1868.

appear, after more than one and a half centuries, at the Siamese Court. King Chuḷālongkorn received him at a solemn audience on the 27th of the same month. Thanks to the tact and ability Commander Racchia displayed, and the reciprocal good-will evinced by both countries, the treaty was brought to a happy conclusion, and the new compact saluted by twenty-one guns on January 1, 1871.

With it Italy scored a remarkable diplomatic success by obtaining the approval of the debated clause in Article VII, while Siam on her part by accepting it placed herself instantly in the rank of the most progressive nations and surpassed, in the matter of liberal policy, all that had so far been accomplished by Far Eastern States. The gist of that article was, in fact, that those who profess or teach Christianity have a right to the protection of the Siamese authorities, provided they performed such a task peaceably and conformably to law. It was accordingly no longer a question, as in the preceding treaties, of a mere passive tolerance, but of a benevolent active protection accorded to the foreign faith. This was a stride forward to which the highest importance was then ascribed, in view of the ominous impression made by the recent massacres of missionaries in China. It was an eminently noble and liberal act, which, while highly honourable to Siam, procured to Italy the congratulations of the other nations.[1] These, in their turn, by virtue of the recognized principle of extension to all of them of the privileges obtained by the most favoured nation, benefited thenceforth in a similar manner, nay, in a yet larger measure, from the advantages gained by Italian diplomacy.[2]

[1] The local *Siam Weekly Advertiser* thus commented upon this success in its number of January 7, 1871: 'The Italian Embassy has gained a laurel in its new treaty with Siam. Christianity is no longer to be simply grudgingly tolerated, but it has a right to the protection of the Siamese authorities. Had this been the view of the case in China, the cold-blooded, premeditated, and fiendish massacre of Tientsin could never have occurred. . . . That Embassy deserves the hearty thanks of the entire Christian community, Roman Catholic and Protestant of all localities, for it has judiciously provided alike for both.' (See for a reprint of this article the *Siam Repository*, Bāngkōk, 1871, pp. 166-7.)

[2] In fact, it ultimately redounded to the exclusive benefit of other nations, as there were, and are, no Italian missionaries in Siam; so we may say that a lance was chivalrously broken by Italy, mindful of her liberal traditions, in favour of the principle of free-thought.

With the object of further strengthening the bonds of friendship thus established between Siam and Italy, and of promoting the development of the trade relations which had always existed between the two countries, there arrived at the anchorage of Siam on March 29, 1881, the Duke of Genoa, on board the corvette *Vettor Pisani*. The day following the Royal yacht *Vesatri* conveyed him to Bāngkōk, where he remained a guest of the King till April 14. From that visit date the very cordial relations not only between the Courts of both States but also between the two peoples, and dates also the direct and active commercial intercourse between them. From that moment Italian subjects began to flock to Siam in order to establish trading concerns, build contractors' offices, or else enter the Government service; and thenceforth the Italian merchant flag began to appear more frequently in port.[1]

The visits of the Duke of Abruzzi in 1895 and 1905, of the Count of Turin in 1898, and of the Prince of Udine during these last years, have done much towards making even more cordial, if possible, the relations between the two nations; while on the other hand the two lengthy stays which his late Majesty King Chulālongkorn made in Italy in 1897 and 1907 resulted in Italy becoming better known and appreciated in Siam.

For the manifold reasons referred to, Siam could not fail to respond with enthusiasm to the invitation extended to her by the gallant and noble city of Turin to participate in the grand fête which the latter has organized with a view to fittingly celebrate the jubilee of the Italian Unification. Besides offering her heartfelt greetings and good wishes, she has endeavoured to take part in a very practical manner by erecting a Pavilion in genuine Siamese national style, wherein to exhibit her productions.

May this Siamese Show, which has originated and grown under such favourable auspices, further increase the commercial relations between the two countries, and make Siam better known in Italy, with which it is only too happy to promote intercourse for the mutual advantage!

[1] The only Italian vessel that had called previously was the same corvette, *Vettor Pisani*, Commander Count Joseph Lovera, on her second visit (April 18-23, 1872), this being the first one after the conclusion of the treaty.

II

Geographical and Commercial Notes on Siam

1. Geographical Position.—The kingdom of Siam is termed also *Müang Thai*, i.e. 'Land of the *Thai*' or 'Free', from the people of Thai race who, having invaded it from the north during the early centuries of the Christian era, settled there, and from A.D. 1257 acquired supreme sway over the country. It is at present the only State in the Indo-Chinese Peninsula which succeeded in preserving its independence,[1] and withal the one that covers the largest area (about 600,000 square kilometres). Forming the central part of that region it extends from 20° to 6° N. latitude, terminating in the Siamo-Malay Peninsula, *vulgo* 'Malay' or 'Malacca' Peninsula. Siam is thus more than twice as large as Italy, but the population is barely more than one-fifth, namely, seven and a half million inhabitants.

2. Boundaries.—Siam is conterminous on the west with Burma (a British possession) and with the Bay of Bengal; on the north with the Northern Shān and Lāu States (settled by younger offshoots of the Thai race), which form part of British and French dominions and separate Siam from the Chinese province of Yün-nan. On the east it borders upon the Më-Khōng River (which separates it from Tong-king, An-nam, and the eastern Lāu States subject to France) and upon Kamboja (under French protection). Finally, on the south it is bounded by the Federated Malay States in the southern part of the Siamo-Malay Peninsula, which are under British protection, and by the Gulf of Siam, which intervenes between the Peninsula itself and the China Sea.

3. Principal Divisions with their Characteristic Features.—Geographically, as well as ethnologically, the

[1] Siam, moreover, forms with China and Japan, the triad of the States of the Far East which alone have succeeded in maintaining their independence.

kingdom of Siam may be considered as consisting of three distinct regions, namely—

(1) *Siam proper*, which extends from the upper part of the Gulf (or from about 13° N. lat.) to 18° N. lat., and comprises the lower and middle valley of the Më-Nam.

Population: above four millions, consisting mainly of purely Siamese elements.

Topographical features: a plain, bounded on both the east and west by limestone hills and intersected by numberless navigable rivers and creeks.

Chief cultivation: paddy. Other products: tobacco, timber, both ordinary and valuable, gums, oleo-resins, pepper, coffee, skins and hides. Metals: gold, copper, iron, lead, gems (rubies and sapphires). Excellent potter's clay. Salt-fields on the coast. Cattle: elephants, bullocks, buffaloes, and ponies in plenty. Fishing abundant, whether in the Gulf or in the streams.

This region is by far the richest, most thickly peopled, and most extensively cultivated of the three. In it Bāngkōk, the capital of the kingdom, is situated.

Principal ports: Bāngkōk, Chanthabūrṇ. Other important towns: Uttaradit, Sawankhalôk, Sukhôthai, Bisṇulôk, Rahëng (or Tāk), Kamp'hëng-p'het, Nakhōn Sawan, P'hetchabūrṇ, C'hainăth, Lop'hburī, Ayuddhyā (the former capital), Sup'haṇ, Kāñburī, Rājburī, Pāk-nam (or Samudr Prākān), Prāchin, Krāt, etc.

Principal islands (*koḷ*): Si-ch'ang, Khrām, C'hāng, Kūt.

(2) *Lāu Provinces, northern and eastern.*—The former extend from 18° to beyond 20° N. lat., embracing the upper Më-Nam valley; the latter stretch eastwards to the Më-Khōng, including the basin of the Së-Mūn, a tributary (from the right) of the latter.

Collective population, over two millions,[1] consisting mostly of Lāu elements (the junior branch of the Thai family).

Topographical features: hilly for the most part; rivers with rapids, which constitute a drawback to navigation.

Chief cultivation: cotton and cereals. Productions: eminently forestal.

[1] The population of the C'hīeng-Māi province alone was 1,088,000 in 1909.

Principal export of the northern Lāu provinces: teakwood, cut in the immense forests, which are the most important in Indo-China. Other products: dye-woods and barks, oleo-resins, lacs (both red and black), silk, musk, benzoin. Minerals: iron, salt, and petroleum (from natural springs). Cattle: elephants and ponies in plenty.

Chief town: C'hīeng-Māi, the former capital of the northern Lāu States, population over 50,000. Other important towns: C'hīeng-Rāi, Lamp'hūn̄, Nakhōn-Lampāng (*vulgo*, Lakhōn), Nān, P'hrë.

Chief products of the eastern Lāu provinces: valuable wood and timber, tinctorial barks, cotton, oleo-resins, lacs (both red and black), silk, gamboge, cardamom. Minerals: gold and copper. Cattle: plentiful, especially bullocks and ponies; buffaloes less numerous, and elephants sparse.

Chief town: Khôrāt (officially termed *Nagara Rājasīmā*), about 20,000 inhabitants. Other important towns: Ubon, P'himāi, Māk-khëng.

(3) *Siamo-Malay Peninsula and Islands.*—From 13° to 6° N. lat. Collective population: 1,106,640, consisting of Siamese elements down to 7° lat., and south of this principally of Malay elements from States formerly tributary to Siam, with some aboriginal Negrito tribes (Semang, etc.) in the interior.

Topographical features: mainly mountainous, as also the islands, which are very numerous and mostly of limestone formation, with steep sides and abrupt cliffs, eagerly resorted to by the collocalia swallows for building their edible nests, as well as by the natives, who with acrobatic skill collect them.

Productions: eminently mineral. Predominating metal: tin (especially on the west coast of the Peninsula), in alluvial deposits and more rarely in lodes. Other minerals: argentiferous galena; gold, both alluvial and in lodes; wolfram; coal. Thermal springs in the north (P'hejburī). Other products: dye and valuable woods, oleo-resins, pepper and nutmegs, peacock and rare birds' feathers, swallow-nests (plentiful along the coast and on the numerous islands near by), *kapi* or *blachang* (shrimp-paste), turtle shells and eggs, pelts of wild animals, silk in the south.

Cattle: elephants and bullocks in plenty; also buffaloes and ponies, but much less numerous.

Seaports and principal towns, east coast of the Peninsula: Ligor (officially known as *Nagara Śrī Dharmarāja* and vulgarly as *Lakhōn*; about 30,000 inhabitants), Singora (in Siamese *Songkhlā*), Patāni, Bān Dōn, C'haiyā, C'hump'hōn. West coast: Ranōng, Takôpa (more correctly, *Takūa Pā*). P'hang-ngā, P'hūket (about 30,000, the chief town on Junkceylan Island), Trang.

Principal islands, east coast (in Gulf of Siam): Samúi. P'hang-ngan, Tau. West coast (in Bay of Bengal): P'hūket (Junkceylan), Yāi (*Pulo Panjang*), Lantar, Terutau (Trotto). Butong.

4. Capital of the Kingdom.—The capital of the kingdom has been, since 1768, Bāngkōk,[1] which in 1909 numbered 628,675 inhabitants.[2] It is situated on both banks of the Më-Nam (the chief of the three rivers which flow through continental Siam from north to south, discharging into the homonymous gulf), at 40 kilometres from the sea. It is gradually being transformed into a modern town, and already boasts of 120 kilometres of carriage roads (including broad avenues planted with shady trees), of 40 kilometres of electric tramway lines, being besides entirely lighted by electricity. On its roads, moreover, myriads of carriages and motor-cars pass to and fro; while its spacious river (from 200 to 300 metres wide and from 10 to 12 in depth) and numerous canals, which have suggested a comparison with Venice, are traversed by thousands of steam-launches and motor-boats. In the river, which also does duty as port, scores of sailing-vessels and steamers are constantly riding at anchor, besides numberless cargo and merchant boats.

Sailing craft and steamers, up to above a thousand tons register and four metres draught, may from the sea proceed up river to Bāngkōk and there anchor or moor in perfect safety.

[1] The capital was established on the western or right bank of the river in 1768, and on the eastern or left bank in 1782 by the present dynasty. Before 1768 Bāngkōk was a mere district town, with two forts on both banks of the river, which may be seen depicted in the map by Coronelli (1666 exhibited in the central hall of the present Siamese Pavilion.

[2] Of these nearly 200,000 were Chinese and 1604 Europeans or Americans, including sixty-five Italians.

Vessels of deeper draught must, owing to the obstacle of the bar at the mouth of the river (over which the maximum depth of water at high tide is from 4 to 4½ metres), proceed up to Bāngkōk and leave the port only half loaded. The rest of the cargo is either landed or completed, as the case may be, at the anchorage outside the bar during the north-east monsoon (from October to April); or else at the sheltered harbour formed by the island of Si-c'hang (*Koḥ Si-c'hang*) situated at 40 kilometres more to the south-east, near the east coast of the Gulf, during the south-west monsoon (from May to September).

Nevertheless the steamship companies which carry the coasting trade between Bāngkōk and Singapore on the one side, and between Saigon and the South China coast on the other, avail themselves of specially built flat-bottomed steamers, drawing no more than 4 metres when half loaded and from 900 to 1,200 tons register, which are thus capable of always crossing the bar at high tide, with a complete cargo or nearly so.

5. Trade and Shipping of the Port of Bāngkōk.—Bāngkōk is the most important port of Indo-China.[1] It lies, in fact, in the centre of the delta formed by the three main waterways of Siam, and is at the same time the terminus of many lines of navigation converging thither from Japan and China on the one side, and from India and the Malay Archipelago on the other.

The return of shipping at the Port of Bāngkōk in 1909 was as follows:—

Cleared outwards.	No.	Tonnage.
Steamers	829	773,310
Sailing ships	3	3,111
Small sailing craft (junks, etc.)	153	
Total . . .	985	Over 776,421

	Francs.
Total value of goods exported . .	205,140,800
Total value of goods imported . .	139,623,400

[1] Though outdistanced in tonnage of vessels by Saigon, the superiority of the latter is illusory, for it is brought about by the large transoceanic mail steamers of the China line, which periodically enter it and sail out, without leaving or taking in any considerable portion of their cargo.

As regards quantity or value of imports and exports Saigon still lags behind Bāngkōk, though not to a large extent.

6. Trade with Italy.—The direct trade with Italy, which before 1880 was *nil*, has since gradually increased to the respectable amount of 1½ million francs. This figure is, however, far from representing, especially as regards imports, the value of goods of Italian origin and manufacture which are introduced into Siam, for at least two-thirds of these reach Siam by roundabout ways, labelled in foreign garb; or else, in the absence of specific information, are of necessity in the Customs returns credited to Singapore.

Here it is possible to supply only the data concerning goods imported directly from Italy to Siam, or vice versa, as shown by the statements published by the Royal Siamese Customs. They are indicated in the tables on pp. xxxvii–ix.

In the said tables goods are not entered which are imported into Siam duty-free, such as for instance those designed for the Court or for Government. These represent a considerable value, amounting up to over one million francs per annum, and comprise marble, steel bridges and wrought-iron work, metal fittings and decorative parts, paint and varnishes, etc.

Among the goods other than those mentioned in the tables which Italy, following the example of other nations, might export to Siam with advantage, the following, representing imports by Siam in 1909, deserve mention:—

	Value in Francs.
1. Ammunition and explosives	122,490
2. Arms (fire-arms, small arms, fowling-pieces, etc.)	85,620
3. Brass ware, zinc manufactures, corrugated iron, etc.	502,022
4. Carriages, carts, *jinrickshaws*, and parts thereof	264,358
5. Cement (21,378 tons)[1]	1,207,724
6. Copper and copper ware	232,396
7. Cotton prints and chintzes (*p'hā-lāi*, *sarong*, scarfs and shawls)	3,215,928

[1] In the line of artificial cements, of which Siam absorbs nowadays nearly 150,000 casks yearly, Italy is as yet unable to compete with other European nations owing to the heavy rates of freightage charged from Italy to Siam. Cement is thus being conveyed in foreign bottoms. The nations concerned forward their cement, at exceedingly low freights, by means of their own steamers, which proceed as a rule direct to Bāngkōk on a regular service.

Imports from Italy into Siam (in 1909) compared with those from all nations collectively

Description of the Goods Imported.	Italy.		All Nations collectively.	
	Quantities.	Value in Francs.	Quantities.	Value in Francs.
A. *Articles chargeable with an* ad valorem *duty of 3 per cent*				
1. Art, works of	[1]	104,108		140,890
2. Books and printed matter		2,306		127,046
3. Chemical products and drugs		8,530		2,215,042
4. China and earthenware (fine)		410		181,150
5. Clothing, articles of		26,980		1,329,746
6. Cotton goods: *Papoons* (*p'hā p'hün*, i.e. colour-woven nether garments) Corges	2,368⅘	112,224	85,485$\frac{17}{20}$	2,888,052
Patas (*p'hā tā*, i.e. nether garment, colour-printed in checks and crosses) Corges	50	1,602	2,861¾	91,804
White shirting Pieces	100	620	374,238	4,399,874
Piece goods Pieces	24	886	291,351	2,731,470
Singlets. Dozens	1,298$\frac{7}{12}$	16,082	76,712⅓	553,796
Unenumerated		7,206		3,542,700
7. Cycles	1	310	708	100,614
Cycles, parts thereof		910		15,890
8. Electrical goods and apparatus		12,672		775,190
Carried forward		294,846		19,093,246

[1] Wherever no quantities are stated it should be understood that merchandise is entered by value only.

Description of the Goods Imported.	Italy.		All Nations collectively.	
	Quantities.	Value in Francs.	Quantities.	Value in Francs.
Brought forward		294,846		19,093,264
9. Fish: sardines, canned		1,438		49,074
Fish, other than canned		52		869,480
10. Glass and crystal ware		494		711,390
11. Gold and silver ware (including plate)		5,924		1,201,968
12. Hardware and cutlery		290		1,189,376
13. Hats, caps, etc. (straw, felt, cloth)		218,878		958,214
14. Leather manufactures: boots and shoes		6,104		518,380
Leather manufactures: other sorts		20,472		566,242
15. Linen manufactures		8,452		57,252
16. Machinery (not steam and not sewing)		572		780,698
17. Metal manufactures: brass and brass ware		16		1,117,866
Metal manufactures: iron or steel		692		545,890
18. Milk, sterilized, canned (from Lombardy)		2,720		614,816
19. Motor-cars		352		258,864
Motor-cars, parts thereof	3	39,678	97	907,424
20. Musical instruments		246		588,000
21. Oilcloth and floorcloth (linoleum, etc.)		140		246,582
22. Paper: unprinted		16,172		994,774
Paper manufactures, unenumerated		7,672		345,432
23. Photographic materials, cameras, etc.		5,082		313,808
24. Provisions, preserves, etc.		19,304		11,312,672
25. Silk goods, unenumerated		4,402		437,350

26. Stationery, other than paper	52,876	2,346		684,156
27. Tiles, glazed		26,558	721,779	128,378
28. Tobacconist's stores (other than manufactured tobacco, cigars, and cigarettes)	14,925	538		123,376
29. Umbrellas, cotton and silk		71,446	246,425	659,966
30. Wood manufactures: furniture and cabinet work		1,550		425,846
Wood manufactures: other sorts		158		144,112
31. Woollen goods, other than piece goods		1,906		177,020
32. Merchandise of all kinds, imported in passengers' baggage		100		1,314,292
33. Goods unclassified		8,036		1,727,940
B. *Wines* (chargeable with an *ad valorem* duty of 5 per cent) *and Spirits* (*ad. val.* duty of 0 fr. 42 per litre up to 50 per cent alcoholic strength and 0 fr. 01 additional duty for every degree above 50 per cent).				
34. Wines and Vermouth		13,050		361,714
35. Spirituous liquors, other than brandy and whisky				
Litres	318	702		75,200
Total value of Imports from Italy		779,668		49,500,816
Total value of goods, other than the above, imported from other nations				90,122,606
Total value of imports of foreign merchandise into the Port of Bāngkōk				139,623,422

		Value in Francs.
8.	Cotton (turkey-red cloth and yarn) . . .	578.474
9.	Cotton (white and coloured yarn) . . .	2.276.324
10.	Fireworks, especially rockets, crackers, etc. .	1.346.738
11.	Hemp manufactures, other than cordage . .	333.916
12.	Kerosene lamps and parts thereof . . .	849.440
13.	Machine belting of all kinds	189.772
14.	Marine machinery, steam and petroleum (for launches, motor-boats, etc.)	1.065.738
15.	Matches, mostly safety	1.565.502
16.	Mineral and aerated waters[1]	159.564
17.	Painters' colours	773.890
18.	Rice-milling machinery	525.198
19.	Silk shawls and scarves, 232,060 / Silk piece goods 6,287,142 . . .	6.519.202
20.	Silk and cotton mixture piece goods . .	361.736
21.	Wax and candles	607.474
22.	Woollen piece goods, including flannels, blankets, etc.	486.258

The above data fully explain why Italy, as regards the importation of her products into Siam, is far behind other nations. In order to win her rightful place, the aggregate value of her imports should increase to at least twenty million francs per annum; but this result will never be realized until she decides to establish a direct line of steam navigation to the Far East.

While, therefore, her import trade into Siam still leaves much room for development, amounting as it does to less than one-tenth of what might reasonably be expected, on the other hand her export trade from Siam may be said to be as yet in its initial stage, and offers far more inducement for the future. Appended is a statement showing all it amounts to at present.

[1] Some natural mineral waters had been already introduced (such as, for instance, Montecatini, Nocera, etc.), but the import came to a standstill in 1909.

Exports from Siam to Italy, 1909, compared with those of all nations collectively

Description of Merchandise Exported.	Italy.		All Nations collectively.	
	Quantity. Tons.	Value in Francs.	Quantity. Tons.	Value in Francs.
1. Teakwood, squares	820·28	312,782	53,224·21	9,442,198
Teakwood, planks	239·09	92,250	6,062·03	1,950,546
2. *Yāng* (*Dipterocarpus turbinatus*) wood	25·10	2,500	326·22	42,118
3. Goods unenumerated		3,200		329,018
4. Articles re-exported		2,000		861,736
Total value of Exports		412,732		12,625,616
Total value of merchandise, other than the above, exported to other States				192,515,252
Total value of the merchandise exported from the Port of Bāngkōk				205,140,868

It should be noticed that in the above total there is no mention of exports of timber and woods, of tin, pepper and other drugs, of gums, rubber, dye, and tanning stuffs, sent from other Siamese seaports, lying either on the east coast of the Gulf or on the Siamo-Malay Peninsula.

In order to attain also in this field of exports the place that should belong to Italy in Siam, the amount of said exports should increase at least to thirty million francs. It is not our purpose here to enter into an enumeration of Siamese products which could be imported into Italy with advantage, because not only are they in evidence in the present Exhibition, but they may also be found amply illustrated in this Catalogue. It will suffice, therefore, to read the descriptive remarks prefaced to Groups XV–XXII, and on the other hand to inspect the specimens exhibited in Classes 80, 90, 98, 100, 106, 115, 119, 122, 123, 127, 131, 133, 135, 137, and 138.

7. Lines of Steam Navigation from Europe to Siam and vice versa.—These are at present four in number, viz.:

(1) One British, i.e. the *P. and O.* (*Peninsular and Oriental Steam Navigation Company*), fortnightly between Brindisi and Singapore, whence transhipment must be made to any of the numerous steamers plying between Singapore and Bāngkōk.

(2) One French, i.e. the *M.M.* (*Messageries Maritimes*), fortnightly between Marseilles and Singapore, whence transhipment must be effected as above, or else one must proceed to Saigon, whence a steamer of the *Messageries Fluviales de Cochinchine* runs regularly to Bāngkōk.

(3) One German, i.e. the *G.M.* or *N.D.L.* (*Nord Deutscher Lloyd*), fortnightly from Genoa, touching at Naples and Singapore, whence a smaller steamer of the same company (the s.s. *Deli*) runs regularly and quickly to Bāngkōk in connexion with the ocean-going steamer.

The three above lines carry also the mails.

(4) One Danish, i.e. the *East Asiatic Company, Limited*, weekly between Copenhagen, Middlesbrough, Antwerp, Genoa, and Bāngkōk, and between Bāngkōk, London, and Copenhagen.

Length of voyage with lines 1, 2, and 3, to Singapore, twenty

to twenty-two days; thence to Bāngkōk, three to four days; total, twenty-three to twenty-six days.

A letter posted in Italy in connexion with the above mails thus takes twenty-five days on the average in order to reach Bāngkōk.

8. European Banks with Branch Offices in Bangkok.

(1) British: *Hong-Kong and Shanghai Banking Corporation.*

(2) „ *Chartered Bank of India, Australia, and China.*

(3) French: *Banque de l'Indo-Chine.*

Some other European banks are represented in Bāngkōk by agencies, but so far none of the Italian ones.

9. Money, Weights, and Measures.—The monetary unit of Siam is the *tical* (in Siamese *bāt*) of silver, the value of which, in foreign transactions, varies from francs 1·88 to 1·93, according to the fluctuations in exchange rates. A gold standard law was promulgated on November 11, 1908, and local coinage has since been put on a decimal basis.

The unit of weight adopted for the foreign trade is the Chinese *picul*, equivalent to kilos 60·453. It is but one-half the weight of the Siamese one (termed *hāb*), which is equivalent to 120 kilos.

The ton in volume employed in timber transactions (for teak and other woods) is equivalent to 50 English cubic feet, or to about 1·41 cubic metres.

10. Postage and Telegraph Rates from Europe to Siam and vice versa.—As Siam is a member of the Universal Postal Union, the postage rates between it and Europe are the same as for Union countries, and the foreign mail service also includes money orders (up to 1,000 francs or £40) and post parcels (up to 5 kilos weight).

The telegram tariff varies from 4·10 to 5 francs per word, according to the line by which the wire is transmitted. The usual lines are via Suez or Fao, and thence via either Moulmein, Penang, or Saigon. The cheapest is via Malta–Moulmein, on which the charge is 4 fr. 10 per word.

11. Language.—The lingua franca employed in the foreign trade in Siam and also as a ready means of communication with educated natives is, as all over the Far East, English.

Foreign firms usually keep their books and carry on their correspondence in English. French is of but little avail, except with French trading concerns.

12. DIRECTORIES, ETC.—Two directories are published in Bāngkōk yearly in English, namely—

(1) *Directory for Bāngkōk and Siam.*
(2) *Siam Directory.*

In these, European merchants wishing to enter into business relations with firms in Siam will find much useful information. As regards advertisements, both in English and Siamese, opportunities are offered by the two bilingual Bāngkōk daily newspapers, namely:

(1) *The Bāngkōk Times* (English and Siamese),
(2) *The Siam Observer* ,, ,,

as well as by the following monolingual dailies:

(3) *The Bāngkōk Daily Mail* (English),
(4) *The Krung Thep Daily Mail* (Siamese),

and by a number of magazines appearing periodically in the Siamese language.

III

Siam and International Exhibitions

The kingdom of Siam is not without experience in the matter of exhibitions, having taken part in them since 1867. In that year it was represented at the Universal Exhibition held in Paris at the Champ de Mars. Here its collections of tobaccos, cottons, cereals, and fishing implements were awarded a gold medal; while three honourable mentions were bestowed upon its exhibition of weapons, clothing, fans, and swallows' nests. Besides, a medal of honour was decreed to the King of Siam of that period (Mongkuṭ) for his beautiful models of royal barges, the same as bestowed upon the Empress Eugenie for her gondolas and caïques.

The following year (1868) Siam took part in the Maritime International Exhibition at Havre, where she obtained the highest award, namely, a diploma of honour and a gold medal for fishing nets, which won the admiration of connoisseurs and were found to be superior to all others both for their ingenious manufacture and their durability.

In the Universal Exhibition of Paris in 1878 Siam appeared in a special section at the Champ de Mars, in a building with the façade in Siamese style, where also the sections of Morocco, Persia, Tunis, and Annam were housed. Besides, it built at the Trocadero a small square pavilion in Siamese style, consisting of sixteen pillars which supported a triple-tiered roof covered with glazed tiles of various colours and surmounted by a painted spire. At this exhibition Siam obtained two diplomas of honour (equivalent to two grand gold medals) for the wearing apparel of both sexes and for silk fabrics, a gold medal for fishing implements, a silver one for musical instruments, a bronze one for native bark-paper, and four honourable mentions for fine furniture, ceramics, saddlery, etc.

In 1885 we find Siam again at the Antwerp Exhibition, where it had sent a small orchestra that distinguished itself by playing, besides national tunes, also European music on native instruments.

In 1889 Siam reappeared at the Paris Universal Exhibition with a section of its own occupying 250 square metres, besides a small but elegant kiosk of 100 square metres enriched with carvings, gildings, and coloured glass mosaics, which were very much admired. One approached it by steps at the four sides, and the entrances were each adorned by a painted figure of a fierce yakṣa or giant wielding the club. This kiosk had been built in Bāngkōk and sent to Paris in sections.

In succession Siam took part in the World Fairs of Chicago (1893) and St. Louis (1904), and semi-officially in that at Hanoi during the winter 1902–3. It was especially in these last that Siam gave particular prominence to her industrial and commercial possibilities; in the preceding exhibitions her artistic and ethnographic aspects had been uppermost, so that more curiosities than merchandise were represented. This

may readily be understood from the fact that they were purely official shows, from which the individual Siamese initiative was as yet absent.

At the St. Louis Exhibition Siam erected for the first time a special pavilion of its own in pure Siamese style. It was a reproduction of the temple or principal building of Wat Beñchama Bop'hitr in Bāngkōk, a monastery erected under the auspices of the late sovereign. On this occasion, in order to make the country and its products better known, an illustrated book (*The Kingdom of Siam at the Lousiana Purchase Exhibition, St. Louis, U.S.A., 1904*, New York and London. 1904) was published for the first time, the chapters of which. written by specialists possessing a first-hand knowledge of Siam. began to diffuse in foreign countries precise information as to the nature, resources, and possibilities of the country.

The next step in the exhibition line was made by Siam in favour of Turin, where her industries and commerce are still more strongly in evidence, with a pavilion which for its magnitude and faithful reproduction of native architecture surpasses all the preceding ones.

IV

Siam at the Turin International Exhibition, 1911

1. Organization of the Exhibits in Siam

As soon as Siam, receiving with enthusiasm the invitation of Turin to take part in its grand manifestation in honour of the Jubilee of the Italian Unity, decided to respond with a show of its own products, the organization of the latter was entrusted, as usual, to the Royal Siamese Commission for Foreign Exhibitions, which had been instituted several years

previously and had attended with success to the preparations for the show at the World's Fair at St. Louis in 1904.

Under the august presidency of the Crown Prince of that time, who has since ascended the throne of Siam, the Commission set energetically to work during the latter half of 1908. It was then constituted as follows:—

President:	H.R.H. the Crown Prince Mahā Vajirāvudh.
Vice-Presidents:	H.H. Prince Rajanī.
	H.E. P'hyā Śrī Sunthōn Vohān.
	H.E. P'hyā P'hip'hat Koṣā.
Secretary-General:	A. Cecil Carter.

Owing to some changes which happened later, the Commission from 1910 until to-day has been composed as follows:—

President:	H.M. the King Vajirāvudh.
Vice-Presidents:	H.H. Prince Rajanī.
	H.E. P'hyā P'hip'hat Kosā.
Secretary-General:	A. H. Duke.

About the end of 1910 the collection of products that were to form part of the Show was completed; but H.M. the King having evinced a desire to inspect it before it was sent to Italy, it was arranged temporarily in halls attached to the Museum of Natural History, Industries, and Commerce at Bāngkōk for the Royal visit.

In the afternoon of December 23 of that year H.M. the King proceeded, with a numerous suite, to the Museum, where he was received by the principal dignitaries of the State and other personages connected with the Royal Commission for Foreign Exhibitions, who accompanied him during the visit. Many guests, comprising the leading merchants and exhibitors, were present at this happy event.

H.M. the King proceeded through the halls, observing the exhibits with a keen interest, and expressing his satisfaction with the Show, which, given its mainly commercial character, had succeeded largely in representing the natural resources and the industrial products of the country.

After carefully examining everything His Majesty received

the exhibitors and merchants, who were presented to him individually, and after having signed his name in the visitors' book he returned to the Palace.

During the few days that followed before the exhibits were packed, the public was allowed access to the Show, and crowds flocked to visit it, evidencing, in their turn, their lively interest in it, and through it in far-away Italy, where the Show was destined to figure on such a happy occasion as the fiftieth anniversary of her Unity.

2. Arrangements for the Installation of the Exhibits at Turin

An Executive Committee attended to all the preparations for receiving and putting in order the Siamese exhibits in Turin.

The Committee was composed as follows :—

Colonel G. E. Gerini, Commissioner-General to H.M. the King of Siam ;

Architect A. Rigotti, Technical Director of the work of erection of the Pavilion ; to whom later was added, just before the opening of the Exhibition,

Chev. G. Vigna del Ferro, Secretary.

At the beginning of September, 1908, Colonel G. E. Gerini the Commissioner-General, proceeded, together with Mr. A. C. Carter, Secretary-General to the Royal Siamese Commission for Foreign Exhibitions, to Turin for the preliminary agreements with the Executive Committee of the Turin Exhibition. Thereupon the Siamese Government accepted with favour the idea brought forward in the report of its two envoys, to erect in Turin a special Pavilion in the national style and of the type called *prāsād*, for the Siamese section, rather than apportioning it among the various departments of the Exhibition. The drafting up of plans for the building was entrusted to the architects, M. Tamagno and A. Rigotti, of the Technical Bureau of the Public Works Department in Siam.

A suitable area on the right bank of the River Po, just a little below the Princess Isabella Bridge, having been selected and

THE ROYAL SIAMESE COMMISSION FOR FORRIGN EXHIBITIONS

H. M. King Vajiravudh - President

H. H. Prince Rajani
Vice-President

H. E. P'hyà P'hip'hat Kosâ
Member

A. H. Duke - Secretary General

COMMITTEE OF MANAGEMENT IN ITALY

Colonel G. E. Gerini - Commissioner General

Arch. A. Rigotti
Superintending Architect

G. Vigna dal Ferro
Secretary

pegged out, the work of erection of the Pavilion was forthwith started in July, 1910, under the superintendence of Architect A. Rigotti, who had meanwhile returned to Italy.

The contract for the framework and parts in wood was given to Mr. N. Previgliano; the principal stucco mouldings were entrusted to sculptor Mr. C. Musso, and the others to Mr. U. Miniati; and the gilding, painting, and decorations to Chev. G. B. Beroggio and E. D. Smeriglio. Each exercised his talents to the full, making it a labour of love, out of desire to render the Show and the Pavilion worthy of Siam, worthy of Turin which gave it hospitality, and of the grand Exhibition that it has so splendidly succeeded in organizing.

Thus, notwithstanding the difficulties that confronted them—and they were not few, principally caused by the adverse weather—the Pavilion with its collections was opened with fitting ceremony on May 27, 1911, in the presence of a numerous and select company of representatives and guests. It was among the earliest, if not the very first, sections of the Exhibition to be in complete order, and from that day it was definitely thrown open to the public, who, flocking to it in crowds, evinced the most lively interest and sympathy, that will be highly appreciated and will certainly find a lasting echo in the heart of the Siamese nation.

3. General Remarks on the Architecture of the Siamese Pavilion

The Pavilion is in that genuine Siamese style which still survives in temples and monuments of the past, more than in those which have to a large extent been modernized.

When viewed from the opposite bank of the River Po, with its triple-storied polychrome roofs, and its tapering central spire gorgeously decked with golden mouldings, culminating in front of the green hill as a background, it gives one the momentary illusion of actually finding himself on the shores of the Më-Nam, before one of those sumptuous buildings that

embellish the Siamese capital. In fact, the Pavilion distinguishes itself entirely from the contiguous buildings by its characteristic lines, its slender and upshooting forms, and for the gorgeous character of its decorative details, which reveal immediately the decidedly Oriental origin of its architecture. This is of the type known in Siam by the name of *prāsād*, which is only met with in royal palaces and in the ancient Brāhmanic shrines, whence it spread also to the Buddhist ones. The building is cruciform on plan, and covers a total area (including the front terraces) of more than 1,000 square metres. With its two main arms formed by the wing galleries stretching out on both sides, it extends along the right bank of the Po, on which it occupies a frontage of 65 metres. A triple order of terraces communicating through a double flight of rather steep steps, as usual in Siam, and gradually leading down to the river bank, forms its basement. The finely moulded railings of the terraces and stairs are supported by little piers, the intervals between which are occupied by tracery painted in malachite green, thus imitating the perforated glazed tiles of the same tint used in Siam. This tracery, which is repeated in the loop windows in the projecting central part of the basement, together with the green of the tropical plants that adorn the terraces, beautifully sets off the glittering white of the walls.

A prostyle, projecting in front of the principal doorway, shelters the main entrance, the door-posts and pediment of which are richly ornamented. The piers of this porch, as well as those of the side galleries, have all capitals moulded after the mystic lotus pattern and gorgeously gilt. The remainder, like the walls of the building, is white ; but on the elevated windows that light the interior, polychrome decorations are in evidence. The ceilings of the lateral galleries are gilt arabesque on a red ground, the doors on a dark one.

A curious particular strikes one here, which is characteristic of Siamese architecture, and it is that the door-posts and corners of the building are not plumb, but slightly inclined towards one another. The same feature is noticeable in the piers, which are slightly tapering towards the upper end. This is due to the fact that Siamese architecture, having had its inception in

wooden structures, has preserved the characteristic features of its origin also in the substantial masonry buildings of a later age. Hence it is that in these latter the inward inclination of door and corner posts in general still prevails instead of a vertical adjustment. It was suggested by considerations of stability in alluvial lands subject to periodical yearly inundations, where the Siamese formerly fixed their abode.

The main building consists of three large halls, the principal and largest of which is that forming the central part, while the other two, a little more elongated, branch out on either side towards the galleries. These are surmounted by a roof in two superposed tiers, while the main building is covered by a cruciform roof in triple tiers surmounted by a pyramid-shaped spire, culminating in a slender gilt finial.

The whole framework of the roofs and spire—as in all buildings in the Siamese style, even of brickwork—is entirely of wood. It is remarkable how the Siamese have happily succeeded in endowing these primitive elements with artistic forms and in idealizing them, taking inspiration from their cosmical and religious myths. The plentifulness of timber for building purposes in their country made their eminently artistic instinct turn preferably to that, inclining them to represent what is beautiful in nature as well as what is supernatural in myth and legend.

Thus, in their decorative motives pre-eminence was given not only to floral ornaments mostly derived from the stems and chalice of the lotus, as may be noticed in the capitals and elsewhere, but also to figures of mythological beings, chiefly inspired by the king of the feathered family, *Garuḍa*;[1] by the *Nāga*,[2] or serpent, his eternal prey; by swans,[3] lions, three-headed elephants; or by half animal and half human beings, reminding us of our fauns, syrens, and centaurs.[4]

Nor is the religious element wanting: witness the representation of celestial beings—of gods, among whom are Viṣṇu

[1] See illustrations on pp. 18 and vi of this Catalogue.
[2] See illustrations on pp. 40 and 228.
[3] See illustration on p. 66.
[4] See illustration on p. 2.

and Indra; and of him whom both for his human and transcendental knowledge the Siamese venerate as their peerless Master, the wise, meek, and unselfish Buddha, whereof from India—their first beacon of civilization—they received his worship together with his gospel, the doctrine of redemption from the sorrows and pains of this world.

Everywhere in the architectural elements of the traditional Siamese buildings—as also in this Pavilion—in their shapes and decorations, ornaments and emblems, one notices the influence of all this mystic religious symbolism.

Thus, for instance, the crested eaves of the roofs are on the motive of the *nāga*, representing two of these mythical serpents held, suspended by their tails, by the eagle-like bill of Garuḍa.[1] The two tails uniting at the apex of the gable combine to form the upper finial, while the two heads constitute the lateral acroteria at its lower ends. On the other hand, the crests or indentations are supposed to represent the imaginary dorsal fins of the ophidian, the body of which is besides idealized in serpentine undulations and contortions. The covering of the roof, even, represents in its turn, thanks to the scaly structure imparted to it by the polychromic glazed tiles, the tessellated and iridescent skin of the serpent. In the ancient buildings of Siam and of the neighbouring Kamboja one sees actual serpents' heads, which are those of the cobra idealized, forming the lateral acroteria at the basis of the gable; whilst in the Siamese style they gradually disappeared, symbolized in ornamental finials, as may be noticed in the present Pavilion. The covering of the roofs of this, however, on account of its transient character (as it must disappear with the closing of the Exhibition), imitates but slightly, with their golden yellow ground encompassed by a dark-blue border running all round, the gorgeous polychromic native roofs.

Like these, however, the cruciform roof of the main building of the Pavilion is triple-storied, a symbol of sovereign power over the three worlds, analogous to our triregnum. For this reason such a style of roofing would not be allowed on buildings not belonging to the effective sovereign of the State or to the

[1] See the two illustrations on pp. 18 and vi already mentioned.

spiritual one (i.e. the Buddha), to whom worship is paid in the temples. That is why these roofs are reserved for royal palaces and shrines. From a practical point of view they are, thanks to their arrangement in superposed tiers with clerestories between, admirably fit for the tropical climate, because well aired; while the steep inclination of the roof also suits the climatic conditions of the country, where it pours during the four summer months, therefore termed the rainy season.

In the tympanum of the gables of such Siamese buildings one observes, according to the object of the same, surrounded by a wealth of golden ornaments, either Indra, on his white three-headed elephant, or Viṣṇu, mounted on Garuḍa, the king of the feathered tribe; or again, as one notices in this Pavilion, the Buddha himself sitting on the white and tricephalous elephant of Indra, in the same posture of meditation he assumed when he attained the supreme knowledge of the Nirvāṇa. This is an instance of a very frequent substitution in Siam of Buddhist symbols for the old original Brahmanic ones, analogous to that which occurred in the Christian Church by the adoption of emblematic and liturgical elements of Pagan origin.

But such a symbolism becomes even more marked in the central spire or pagoda which surmounts the Pavilion. It is a seven-storied pyramid representing the seven tiers of Heaven, or maybe the planetary spheres. In these are the abodes of the celestials of the different ranks, consisting of their *vimānas* or aerial palaces, symbolized in as many niches or gilt canopies, with ogival pediments also in the *nāga* motive, that recur between antefixæ on each face and at every story of the pyramid, well detached on the dark-blue background of the same. In the present instance no deities are shown in their respective niches; but their image, although often left to be supplied by one's imagination, is sometimes represented in sumptuous Siamese buildings.

At the very apex of the pyramid culminates the slender terminal, entirely gilt, shooting up boldly towards the sky, a flaming emblem of glory typified in the sunbeam.

The allegory is completed by two flagstaffs, that, from both

ends of the lower terrace in front of the Pavilion, rise slimly before the lateral galleries, surmounted by a golden figure of the sacred swan, *haṁsa*,[1] the vehicle of Brahma (an ancient solar deity), this being a solar symbol also, as it is of the Greek Apollo Hebdomeion. Above the golden swan towers the white conical umbrella in many superposed tiers, emblem of the universe; this being depicted, almost as in Dante's conception, in the form of a cone with seven concentric circles of mountain ranges culminating in the mythic mount Meru, apex and fulcrum of the world—like Mount Atlas of the Western cosmogony—an idealization of the highest peak of the Himālaya. Thus it happened that the white or golden umbrella so shaped is the symbol of royal power, of dominion over the world, in which character we shall meet it again in the royal flag in the central hall of the Pavilion. Underneath the two emblems above referred to—the umbrella and the swan—flutters here the national Siamese flag, a white elephant on a bright-red ground. This is, in its characteristic form of a staff rising between two small posts arabesqued in gold on a red ground, the typical standard seen in Siam in front of most temples; and reduced to its simplest expression, a tall bamboo cane, surmounted by a little conical umbrella of white calico or even paper, erected round the areas where festivals or auspicious rites are performed.

Having thus given a general survey of the exterior features of the Pavilion, and having cursorily noticed the eminently symbolical character of its architecture and decorations, it is high time to enter and visit the interior.

4. Summary and Visitor's Guide to the Siam Pavilion and Show

A few short notes will suffice to give an idea of the interior of the Pavilion, in the visit of which the plan herewith appended (facing p. lxiv) and also the explanations contained in the body of this volume should prove of further assistance.

[1] See illustration on p. 66 of this Catalogue.

To the one and the other we shall often refer in the course of this brief description.

Access may be had to the Pavilion either by the foot-bridge crossing the Po just below the Pavilion, or from the embankment along this side of the river, or again from the terrace which communicates with the contiguous pavilions rising on the same (right) bank. We will here start from the side of the foot-bridge, and exactly from the left gallery, marked A on the plan.

Gallery A (left wing).—We enter it by the portal situated at its extremity, which we see surmounted by a shield with the name 'Siam' in white letters on a red ground, emblazoned in a golden frame in the national style, with two unfurled Siamese flags on either side. Here we notice in the intervals between the piers show-cases in which there are skins, hides, horns, and barks for tanning purposes (Group XXII, Class 138; see pp. 251-3); while mats of various sizes and workmanship are hung about higher up (Group XXI, Class 137; see p. 248). The larger ones between the piers on the open side of the gallery, looking towards the front terrace and river, are of coarser and stronger weaving, being designed in Siam to take the place of our tarpaulins and linoleum; they are generally employed for covering boats, carts, and merchandise. Here they prove very useful to shelter the gallery from the sun and rain that might penetrate obliquely from the front. From this gallery, ascending a few steps, we enter the first hall, marked on the plan also by the letter A.

Hall A (left-hand side). — The walls of this hall are upholstered in dark-green satinette, whilst the ceiling is enriched with polychromic arabesques and gildings in genuine Siamese style. In the square niche above the entrance is displayed the national Siamese flag; higher up on the walls mats of dainty Siamese designs are hung, some in well-blended tints and shades, others with figures of animals (tigers, crocodiles, peacocks), and in the intervals between the lofty windows white and gold indented discs catch the view, representing the *chakra* of Visṇu, an emblem of the solar orb revolving in perpetual succession, and therefore a symbol of dominion and universal sovereignty, ensign of the monarchs. In Buddhism it moreover

typifies the *Dharmachakra*, 'Wheel of the *Dharma*,' or Law (of cause and effect), that the Great Master metaphorically set in motion and sent revolving about the world, through the proclamation of his doctrines.

This hall is mainly devoted to the show of the Siamese Education Department, primary and middle schools for boys and girls. In the double row of show-cases occupying the centre of the hall and surmounted by a long gilt frame, are displayed programmes, time-tables, textbooks, and girls' school-work, which fill also the two wall-cases on either side of the entrance. Around the walls are hung up in frames drawings by the middle-school boys, which are inspired mainly by national ornamentation (Group I, Class 3 ; see pp. 19–24).

Beside this, on the left-hand wall hangs a large teakwood frame, enriched with beautiful Siamese carvings, containing a series of photographs of the Siamese State Railways. The pictures show the lines, stations, iron and concrete bridges, and landscape views of several parts of the country through which the locomotive now rushes triumphantly (Group VII, Class 40 ; see p. 54). On the table beneath lies open to inspection the printed report on the railway traffic in Siam for 1910.

In the near corner of the hall a native loom for silk-weaving is mounted ready for work. It is in rosewood of the traditional type obtaining in the country, and cannot fail to arouse curiosity and interest. The wall-case near by contains a collection of spinning and weaving gear, and a series of photos of the Royal Agricultural College and sericulture schools in Siam (Group XIX, Class 130 ; see pp. 216–21).

The corresponding wall-case towards the right-hand wall is instead occupied by the show of sericulture, and in it may be observed specimens of silkworms, pupæ, cocoons, indigenous mulberry leaves of several varieties, and implements for silkworm rearing (Group XVI, Class 95 ; see pp. 151–6, 158).

In the other show-cases along the wall on the right are disposed samples of the cottons cultivated in Siam, the tree-cotton (*kapok*) included, of native cotton fabrics (Group XIX, Class 127 ; see pp. 209–13, 221), and of various textile fibres, such as *ramie*, Siamese hemp (which differs much from ours),

and interesting fibre of wild plaintain (Group XIX, Class 129; see pp. 213–16, 221).

The next show-case contains specimens of the curious native bark paper, both white and black, in plain sheets and folded screen-like into blank books (Group XXIII, Class 144; see pp. 262–7, 269).

In the nearest corner is a bamboo trestle or towel-horse belonging to Group XXI (Class 137), of which more examples will be found in the central hall.

While wending our steps towards the central hall we notice on the side of the entrance a large frame with photos of the brisk and handsome Siamese pony. The upper picture represents the reigning King of Siam on horseback, and that on the left one of his brothers, Prince Nakhon-chaiśrī, actual Minister of War, also on horseback. Another photo shows a racer with his jockey on the race-course at Bāngkōk (Group XI, Class 59; see pp. 74–6).

On the opposite side of the same entrance to the central hall hang other drawings by the schoolboys. The visitor now finds himself in the central hall.

Central Hall. — The decoration of this is, as may be expected, more elaborate than elsewhere. The hall is upholstered in old-gold satinette. From a *chakra* or symbolical wheel at the top of the lofty ceiling eight festoons of green foliage, interspersed with multicoloured blossoms, hang in graceful curves towards the four corners of the hall, to which they are tied by ribbons in the national colours (white and red). In several ogival niches high up are placed golden images of the Buddha in the various postures in which he is traditionally represented; while around the walls, instead of the simple *chakra* wheel, this emblem is noticed in combination with the *trī*, or trident of Śiva, forming together the *chakra-trī* or *chakr-trī*, the ensign of the dynasty now reigning over Siam.[1]

On the wall facing the main entrance and on either side of the central niche, two royal Siamese flags are displayed with the

[1] In honour of its founder in 1782, who bore the title of *Chāu P'hyā Chakkrī* or *Chakr-trī*) and ascended the throne with the title of *Mahā Chakkrī*.

royal coat of arms, consisting of a tripartite shield surmounted by the *chakra* wheel with the trident, and above this, by way of crest, by the conical *Mongkut*, or royal crown; all this among two white *c'hattra*, or symbolical seven-tiered umbrellas, on a dark-blue ground. A similar flag may be seen adorning the wall opposite and just above the principal entrance to the building.

The lofty niche of honour, in the centre of the wall facing the main entrance to the Pavilion, is encased all round by a gilt frame moulded after the Siamese style, as are all the other frames of the show-cases in this and other halls. The upper part of the niche is draped in pink satin, the genethliacal colour of the deeply lamented King Chuḷālongkorn,[1] whose life-size photo hangs in a frame, surrounded by festoons and garlands as a dutiful homage and reverent tribute to the memory of him under whose auspices this Show was decided upon and the preparations begun, and of which his premature demise prevented him seeing the completion.

Below are life-size portraits of his son and successor, Vajirāvudh the present King, and of the Queen-Mother Sawabhā, which at the same time form part of the photographic show (Group III, Class 16; see p. 32). The lower part of this niche is profusely decorated with beautiful ferns and ornamental exotic plants. On the left side of the same niche, and in a semicircular wall-case, are displayed on a pedestal, in diverging directions all round from a common centre, a number of feather fans of the most varied shapes and

[1] This is in accordance with the ancient tradition which assigns an auspicious colour corresponding to that of the planet that presided over the week-day of birth. To this latter must also conform the initial of the name conferred upon the new-born child. Thus, for instance, King Chuḷālongkorn, having been born on a Tuesday (September 20, 1853), which is one of the early week-days, received the said name beginning with C, one of the first letters of the Siamese alphabet, and his genethliacal colour was pink, corresponding to Mars and therefore to Tuesday. The present King, having been born on a Saturday (January 1, 1881), had conferred upon him a name (*Vajirāvudh*) having a V for initial, one of the last letters of the alphabet, and his genethliacal colour is dark-blue, corresponding to Saturn and therefore to Saturday. His grandfather, King Mongkut, having been born on a Thursday (October 18, 1804), received a name beginning with M, and his auspicious colour was dark-green, belonging to Jupiter; and so forth.

colours, mostly provided with long handles, as employed in Siam (Group XX, Class 133; see pp. 223–7, 254).

The corresponding show-case on the right-hand side of the niche is occupied by a large assortment of straw, wicker, and basket-work, and of knick-knackery (Group XXI, Class 137; see pp. 239–45, 248–50). The wicker specimens range from baskets and trays to cigarette-cases and straw hats; while the knick-knackery comprises among other things a small screen inlaid in mother-of-pearl, with the panel ornamented after the Siamese style in lacquer and gold.

Metallized photographic reproductions of masterpieces in Siamese cabinet-work, ornamented in lacquer and gold, are on view in several frames about the pilasters of this central hall (Group XIII, Class 72; see pp. 77–81), on two of which (near the show-cases of the sericulture) hang also two small glass cases containing specimens of cocoons, twisted silk, organzines, and silk fabrics.

Of the two wall-cases on either side of the main entrance the right-hand one contains specimens of colour photography, representing views of Siamese life and landscape, besides a silver metallized photo of Siamese ornamental art work (Group III, Classes 16 and 17; see p. 32).

The left-hand wall-case is, on the other hand, wholly devoted to the mineral show. Besides samples of the principal minerals of Siam (among which tin holds the first place in point of plentifulness, as the country possesses extremely rich alluvial beds of tin-ore) one sees also in glass tubes specimens of its gems (rubies, sapphires, and spinels); whilst in a series of photos views are shown of important mining works and machinery (Group XVIII, Class 106; see pp. 173–81, 205).

Having gone all round this hall, it behoves one now to pause a little in front of the magnificent central show-case, which attracts the visitor's attention from the very outset. It is in genuine Siamese style, as may easily be inferred from its square form, slightly tapering towards the summit (so that the corners instead of being plumb are somewhat inclined inwards), from its peculiar gilt mouldings, and from the gilt pyramidal spire that surmounts it, culminating in a slender terminal rising almost as

high as the ceiling. Internally it is occupied by several tiers of shelves arranged in pyramidal form, and covered with pink and dark-blue satin, on which the exhibits are displayed. On the upper tiers, glittering in their gorgeous gilding and studded with imitation jewellery, are nine theatrical masks such as are worn by Siamese actors in scenic adaptations of the *Rāmāyaṇa*, the well-known Indian epic, which supplies so much material to Far-Eastern nations, and is the main source of inspiration to their bards (Group XIV, Class 77; see pp. 83–112, 246).

On the lower platform of the same case are arrayed specimens of Siamese silver plate and other fine metal-work, which testify to the skill of the artisans in chasing and enamelling. It will be noticed that most of these pieces of art in repoussé, whether bowls, goblets, or trays, embody ornamental motives drawn from the lotus pattern and Siamese mythological subjects (Group XXI, Class 135; see pp. 229–39, 246–7). One may now pass into the right-hand hall marked B on the plan.

Hall B (right-hand side).—This hall is upholstered similarly to Hall A, and accordingly one notices high up on the walls the same emblems, flags, and figured mats, and below these an almost similar disposition of show-cases. But the character of the exhibits is totally different, as this section is, with a few exceptions, mainly devoted to industrial and Siamese land products. If the first hall is dedicated principally to education, and the central one to fine arts, this one is essentially of a commercial character. Here men of business will be especially interested, although attractions for the fair sex and gourmets are not wanting, for one finds displayed the chief productions of Siam, of its fields and woods, of its seas and rivers.

Turning immediately to the right, one finds himself in front of the first wall-case, occupying a position communicating with the Central Hall. On the upper shelves are arrayed in glass vases the products of extensive cultivation. Among these paddy, of which many varieties are exhibited, naturally holds the first place, followed by samples of other cereals, oilseeds, etc. The collection is surmounted by a fairly large cocoanut (Group XVI, Class 90; see pp. 140–50, 158–9).

The lower shelves are occupied by numerous models of Siamese fishing implements, all interesting; but the most striking is the ingenious, not to say magical, 'phantom canoe,' in which the fish spontaneously jump into captivity (Group XV, Class 82; see pp. 124–30, 134–5).

Proceeding further one sees a collection of knives and other cutting utensils used by Siamese peasants. Not a little curious will appear the jungle-swords and knives, and also the shapes of some of these implements, strange to us, yet in most instances of neat finish (Group XVI, Class 92; see pp. 150, 157).

Near by on the walls are photogravure reproductions of maps executed in Siam by the Survey Department; in other parts of the hall more will be found, as well as interesting specimens of old native maps (Group III, Class 18; see pp. 150, 157).

And so we reach a gigantic show-case which occupies the middle part of the right-hand wall and contains the forestal exhibits. Here are arrayed specimens of the principal woods for cabinet-work and building purposes that come from the forests of Siam. The trunk of many a tree is presented to the view cut lengthwise and across, so as to show the features and arrangement of the grain and fibres or veins. Besides the familiar teak, of which Siam possesses the largest and best forests in the world, other excellent woods will attract attention, some of which are admirably suited for fine cabinet-work, and no less beautiful than the most famous of other countries. On the upper shelf one may see in glass vases samples of other forest produce, such as wax, rubber, oleo-resins, and stick-lac, besides a coloured drawing of the insect, magnified, which produces lac in Siam. Finally, higher up are hung photos showing views of forest-works, among which most interesting will doubtless be those illustrating the invaluable work of the intelligent elephant, an animal which is as indispensable in the forests of Siam as the ox and buffalo are in the fields (Group XV, Class 80; see pp. 113–24, 131–3).

Proceeding further one comes to a small stand in front of which are ranged three little cases with glass covers, replete with specimens of stick-lac, coming from the forests of various provinces of Siam (pp. 122, 132, 187). Right against the wall

stand two glass cases containing numerous bottles, some filled with aromatic essences and extracts for confectionery and aerated water manufacturers, and the others with colouring extracts for confectionery, derived from the local flora (Group XVII, Class 100; see pp. 168, 171).

The series of drugs and condiments continues in the wall-case near by, where one may notice samples of pepper, coffee, nutmeg, and cardamom (pp. 165–71). The upper shelves are occupied by samples of cleansed and milled rice and rice-meal, as a complement to the show of food-stuffs and industries relating thereto (Group XVII, Class 98; see pp. 161–4, 170).

Passing now to the corresponding wall-case on the other side of the hall, one notices on its upper shelves, in glass vases, numerous specimens of Siamese tobacco, both cut and rolled up into cigars and cigarettes. Among these, dainty and curious, will be found those wrapped in the rosy petals of the royal lotus (Group XVIII, Class 124; see pp. 201–4, 207–8). Other classes of this group are represented in the lower part of the same case by specimens of wood oils (Class 115, see pp. 186, 206); of soaps of local manufacture (Class 118, pp. 187, 206); of dyeing substances, among which the one employed to dye black deserves special attention (Class 119, pp. 187–92, 206); of tanning materials; of rubber and resins, whereof the black lacquer or varnish is highly interesting (Class 122, pp. 193, 207); and of perfumery oils and resins, among which the Siamese Benzoin, the best in the world, hold the first place (Class 123, pp. 194–201, 207). No one, whether merchant or layman, can miss the opportunity, not only of glancing at, but gaining a better acquaintance with, these admirable and valuable substances peculiar to Siam, which fully deserve to be better known, studied, and experimented upon in other countries.

Turning now towards the left, one will scarcely fail to pause before the splendid collection of sketches and paintings of Siamese types and landscapes displayed here on the wall. These will post us up better than any literary description, however able, of the characteristics of Siamese life and surroundings (Group XXIII, Class 157; see pp. 267–72).

On a long table beneath are displayed sample copies of newspapers and other periodical publications, which give one an idea of the output of the local Press.

Now let us pass on to the show-case lodged in the wall separating this from the Central Hall. In the upper part of the case we find a series of photos representing some of the most important works recently completed in Siam with a view to facilitate internal navigation (Group VIII, Class 46; see pp. 62–5). On the shelf below three models of native boats are on view (Group VIII, Class 41; pp. 55–61, 64). Finally, lower down tiny models of Siamese bullock and buffalo carts (Group VII, Class 38; pp. 41–50, 54) and of Siamese ploughs and harrows (Group XVI, Class 87; pp. 139–40, 158) catch the eye. It will be noticed that in genuine local types of boats and carts no metal is used, nor even in the ploughs, with the sole exception of the ploughshare, which is made of iron.

Having thus completed our tour round the hall, let us now proceed to the show-cases standing in a double row in the middle. The first one met with when coming from the Central Hall contains samples of spun silk. This is followed by a double series of show-cases surmounted by a long glass frame of Siamese design, enriched with gilt mouldings, on both sides of which is displayed a collection of photos of palaces, bridges, and other buildings erected by the Public Works Department (Group VI, Class 37; see pp. 33–7, 39). The show-cases underneath are replete with specimens of Siamese silk fabrics of different designs and shade, shot silks included, some of which cannot fail to be appreciated for the fineness of workmanship and the delicacy and tasteful combination of colours (Group XIX, Class 131; pp. 216–20, 222).

At the farther end of these rows of show-cases stands a large frame made of teakwood finely carved, which contains, photographically depicted, scenes of the Siamese Postal Service, with its head office and schools, its canoes and steam launches, and its specimen postman in his uniform. Here one grasps, at a glance, the manner of working of the Postal Department, the sorting and delivery of mails, even to distant places in the interior, gaining thereby an insight into methods of organization.

Near by is exhibited a collection of Siamese stamps, past and present (Group X ; see pp. 68–71).

Thus we have reached the end of the hall, and now it remains only to pass on to the contiguous gallery of the right-hand wing, marked B in the plan.

Gallery B (right-hand wing).—The first objects that catch the view here are two small tables upon which stand models of sailing-craft fully equipped, such as may be seen plying on the seas and rivers of Siam. These complete Class 41 of Group VIII (see Hall B, p. lxiii).

Further on, on another table we find samples of earthenware such as is locally made for domestic use ; here are pitchers, jars, pots, and basins, some of them gracefully modelled after the lotus pattern, by means of primitive implements that form part of the show (Group XVIII, Class 110 ; see pp. 181–6, 206).

The walls of this gallery are, like the other one on the left wing, decked with mats, some of which also hang in the intervals between the piers. There are both plain and figured specimens, affording shelter from sun and rain.

Here the tour round the Show ends ; but for those who have leisure it is worth while to tarry a few minutes longer and go out on the terrace to give a look at the porch and main entrance to the Pavilion ; to view the external decorations, especially on the gables ; and to examine the curious little gilt bells (described on p. 263 below) hanging from the eaves, which, swinging in the breeze, emit a sound so sweet and Po-etic (just as befits the Po banks). No less worth seeing are the characteristic flagstaffs already described (pp. liii–iv above), and finally, the extra moments spent on the terrace will find ample repayment in the beautiful view of the river and of the whole Exhibition that can be enjoyed from that lofty position.

Even a flying visit to the lower terrace will not prove devoid of interest, descending the steep staircase that in true native style leads down to it. Thence, by an easier flight of steps, one may go down to the very green bank of fair Eridanus, no less fair, no less clad in sunlight and verdure in this summer season, than the far-away Më-Nam where the prototypes of the Siamese Pavilion proudly rear their golden spires.

G. E. Gerini.

Descriptive Catalogue of the Siamese Exhibits

Kinnari (celestial nymph having the lower part of the body like a bird).
(Exhibit No. 124 of the present Show.)

GROUP I

Culture and Education

Retrospective Notes

AS regards culture, Siam was always in the sphere of influence of India, down to the modern period of the epic deeds of the courageous Portuguese navigators who opened to European commerce a new and easier way to the East Indies. It was, in fact, through this Eastern mistress of civilization, which admirably corresponded to Rome in the West, through the medium of the Buddhist missionaries in the fourth century before Christ, of the Brāhmaṇ teachers and of the Malabar and Coromandel merchants who immediately followed in their wake, that Siam received the first gleam of civilization.

From that time onwards its laws and all its political and religious institutions, as also its arts, have been moulded after those of India, quite different to the case of Eastern Indo-China on the other side of the mountain range which runs parallel to the coast, where in a short time the influence of Chinese civilization predominated and took a firm root. This mountain chain formed a natural barrier to the further extension towards the West of the invading civilization and of the ideographical writing of the Chinese; whence it is that, whilst in Siam, in Kamboja, and in the Lāu country which lies north of them, Indian institutions still exist, in the countries on the other side of that mountain range, that is, in Lower Cochin-China and Annam, these institutions were early supplanted by those of China.

From the influx of this Indian civilization imperishable monuments remained in Siam, in its primeval capitals Sawankhalôk, Sukhôthai, Lopburī; as also in Kamboja in the peerless buildings, known but lately to Europeans, among which the most famous and best known are those of the Angkor group.

Along with religion, civil institutions, and arts, literature was also imported into Siam from India, principally Buddhist, together with the language of its sacred books, the Pāli, and the Indian alphabetic writing, which latter was adopted to represent, with necessary modifications and orthographic variations, the native language also.

Shortly after the middle of the thirteenth century, the *Thais*, ancestors of the present ruling race in the country, natives of the South of China, having established themselves in Southern Siam, the Thai alphabet, prototype of the present one, was devised, with the help of Brāhmaṇ teachers, on the model of those of Indian origin already in use in the country.

Up till the most recent times, when Western sciences and systems of teaching were introduced on a large scale, culture and education were entrusted, as a rule, to the Buddhist monks. It was in the convents, as in Europe in the Middle Ages, that the great mass of the people received from time immemorial their culture; and until lately the more than thirteen thousand Buddhist monasteries in Siam represented as many schools of primary, ethical, and religious teaching, recalling in the Far East the Western cloisters from which emanated the scholastic culture which was in vogue among us in the Middle Ages. In the remotest villages the monastery, or *wat* as it is called in Siam, is up to the present day the only school, gradually supplanted from the point of view of modern culture by the schools which from the capital as a centre of humanities and of modern science, following the telegraph, the motor-boat, and railways, spread themselves more and more towards the farthest points of the kingdom.

In the meantime, down to this recent period of renascence, education, at least in the case of the male sex, was made obligatory, not so much by civil as by religious law, which

imposed on every citizen the Buddhist initiation as a counterpart to the Brāhmaṇic one. In homage to this venerable tradition every boy approaching the age of puberty, as it is even to-day, from the King to the least of his subjects (with ceremonials which might be compared to that of confirmation or first communion among us, inasmuch as it constitutes one of the most important domestic festivals), receives the first ordination of *sāmaṇēra* or novice (in Siamese *ṇēn*) in his own parish, that is to say, in the nearest Buddhist temple, or that which suits him best, and then passes, in the adjoining monastery, a minimum period of three months' retreat.

In order to prepare himself for the ritual of this first ordination, which requires, beyond knowing how to read and write the national tongue, some knowledge not only of the sacred writing but also of the Pāli language (employed like Latin amongst us in the sacred books) in order to understand at least the elementary rules of discipline of the Order, to which in his position as novice the child is obliged to conform, he had to undergo a preliminary training under the guidance of an ecclesiastical or secular teacher. For the sons of the people this knowledge was naturally acquired by frequenting the lay school for children connected with every monastery.

This was at once school and college, because many parents confided their child, as they do to-day, to the care of some monk friend or relative, who acted for him as pedagogue; and so the boy passed his life in the convent under the guidance of him whom he served as a good *Śiṣya*, or disciple of the old, school, following him even on his errands. During the retreat in his quality of novice, this education was perfected in proportion to the duration of the retreat, for it could be prolonged, according to the wish of the relatives and the vocation of the child, for one or more years. Returning to his family the young man was therefore in possession of an elementary scholastic education more or less analogous to that received in our convents and primary schools in days gone by; only that in the place of a sprinkling of Latin, catechism, and sacred history, he had acquired a superficial knowledge of Pāli, of ecclesiastical discipline, and of Buddhist hagiology. That made him fit to

seek an occupation, or in some wise to be useful to himself and to his family either in industry or in commerce, and was sufficient for the needs, as for the popular aspirations, of the time, at any rate until the youth had become a full-grown man.

As, however, the above-mentioned ordination of the novice was not considered sufficient to complete the education of the young man, neither was it thought absolutely indispensable, every youth before becoming an adult, and before thinking of marriage, had, as he still has, to receive the full ordination of *bhikkhu* or friar, and in such a capacity to pass another period of at least three months in a *wat* or Buddhist monastery. This is the most important rite of the ethic-religious education of the young man, and it takes place usually when he has reached his twentieth year. Inasmuch as the discipline inherent to this ecclesiastical condition is more severe, in the same manner the study of the Sacred Scriptures must be more thorough; so that, together with some notion of metaphysics, he acquires a richer endowment of literary knowledge, both in the Pāli and in the national language. When he left this retreat the young man was considered fit for his duties of citizen, and by the instruction that he had received ready to fill a situation, to administer his own property, and to keep his family when he got married.

Naturally he could, according to his vocation, prolong his sojourn in the monastery for several years, or even in certain cases, for all his life; otherwise he had the option of re-entering the Holy Orders for a time more or less protracted; and also, when tired of life, or in consequence of bitter delusions and misfortunes that had come upon him, he could forsake the world and peacefully end his days in the monastery.

This state of things, although naturally attenuated by the increasing influence of modern civilization and culture, still exists in Siam. It explains how from time immemorial the country, at least as regards the male portion of the population, has always been free from the odious plague of analphabetism which still contaminates many of the most civilized modern countries. As to the feminine sex, if its education, down to recent times, has not been looked after as it should be, this

fact has to be put down to the prevalent Eastern ideas as regards the mission and education of women.

Notwithstanding this it must be noticed that in this connexion the Buddhist religion overtops all others of the East, as the Christian religion all others in the West, on account of its tendency to raise woman's condition, this being the consequence of the principle of equality and fraternity which culminates, as in no other, in these two religions, so alike, and with so many points of contact between them. It is owing to this noble principle that down to the fall of its ancient capital Ayuddhyā in 1767 there flourished in Buddhistic Siam the convents of *bhikkhunī*, or nuns, and of *agapetæ*, in which a good number of girls and also grown-up women received a primary literary education. This education, on the other hand, was always imparted to the daughters of the richest families, and especially to girls belonging to the Court, from among whom came forth not a few gifted and polished writers who honoured the national literature.

From the advent of the first Portuguese envoys into Siam in 1511 dates the introduction of culture and Western science in the country, which gradually increased through the work of Catholic missionaries, who very shortly established schools and seminaries for the natives in the old capital Ayuddhyā and in the principal neighbouring towns. The Buddhist religion—or, perhaps I should say, philosophy—more tolerant than any other ethical system of whatever worship or creed, forerunner in this, for more than twenty-two centuries of the principle of free-thought, which for us is an intangible conquest of but recent date, always led among the Siamese to the greatest tolerance not only for the most open manifestations of Muslimic fanaticism, but also for the free exercise and propaganda of other tenets. But the magnificent deeds of the bold European navigators who first by a new way reached the shores of that far-away country, and the wonderful conquests of Western genius and refinement introduced into it by the merchants and missionaries which very shortly followed in their footsteps, could not fail to awaken in the Siamese, besides the liveliest admiration, also enthusiasm for the civilization and the people beyond the seas, and in this way predispose them to receive

with benevolence, and even to make them eager (in their craving for anything connected with human progress, and still more with the human destinies of this life and of the unknown future) to know the progress of the Western people in arts and philosophy. It was thus that from the Court itself, whence, in Siam, the example of modern innovation always was set to the lowly, a deep interest was evinced (which quickly spread to the other classes) for everything which came from the West. Cordial diplomatic relations were established with the 'Roi Soleil' and with the Holy See by means of reciprocal exchanges of embassies. This for a short time aroused the hope, which has ever been foiled, of an early general conversion of the nation to the Catholic faith. Anyhow, the outcome of all this was, through the medium of some learned Jesuit missionaries who were at the same time able astronomers and mathematicians, to make known to the Siamese the latest improvements of these sciences from Galileo to Cassini. A remarkable industrial progress followed: mines were opened, aqueducts established, bridges and roads, palaces and forts erected, according to the plans and under the direction of European specialists. From this period dates also the sending of the first batch of Siamese students to Europe, who, having been admitted to the Louis-le-Grand College, quickly made so much progress as to be able to deliver a speech in Latin and to expound a thesis at the Sorbonne on the occasion of the visit to these institutions of the Siamese Embassy in 1686. Five other youths of noble families were sent by the king of Siam to that college with the embassy that went thither in January, 1688.

But reactions brought about by political machinations and intrigues of missionaries in the first place, then the attacks of the Burmese which led to long wars and finally to the overthrow of the Ayuddhyā dynasty and the destruction of the capital itself in 1767, produced during the whole of the eighteenth century a delay, if not also a falling off, in the development of the exotic culture in the country. The Siamese were now too much preoccupied in redeeming their country from the foreign invaders who oppressed it. This admirable, and in many

respects heroic, work being accomplished by the dynasty which chose Bāngkōk as its capital in 1782, and which is still the ruling one, after having reorganized the country and restored a firm administration, could turn its attention to reviving the now fallen culture.

The libraries of the monasteries being refurnished as well as possible; the traditional schools being reopened in connexion with these; the examinations of Pāli and Buddhist theology for the clergy being restored; the scattered Catholic missionaries, who for several years had been compelled by the wars and consequent anarchy to leave the country, being welcomed on their return to their stations; the first Protestant missionaries, which England and also the far-off United States of America had begun to send there in good numbers, having found hospitality—European culture began to re-flourish in the schools which had been founded by them in ever-increasing numbers. At the same time the art of printing, introduced by the latter, began to diffuse among the Siamese, translated and printed in their own language, after the never-failing Bibles, small elementary tracts on European science; and in 1844 the first newspaper appeared in the Siamese tongue.[1] In the meantime mechanical workshops sprang up through the initiative of several eminent personages of the time, and the first square-rigged vessels and the first steamers for commerce and defence were constructed.[2]

But the real soul of this revival of the studies and of the introduction of Western culture was a Royal Prince of high rank, as also of conspicuous talent and extreme broad-mindedness of views, true type of a modernist in religious and secular matters, who, having left the cloister to ascend the throne by the unanimous wish of his people, with the title of King Mongkut, in 1851, during his short reign laid the foundation of the modern development of Siam. It was he who, besides other things, began to introduce European teachers into his own palace—as he had already done for years in the quietness of his monastic retreat—and had his own children educated in

[1] For further details see the note prefixed to Group XXIII.
[2] See the note which precedes Group VIII.

the European sciences and tongue. In the other classes he patronized and promoted the opening of both lay and religious schools, with the help of the most learned Europeans that could then be found in his dominions.

Having reformed the monastic discipline in an orthodox sense by taking it back to its original pure sources, he reorganized the teaching and the examinations of Pāli, sacred hermeneutics and theology, introducing emoluments for the most enlightened members of the clergy and encouragement prizes to the studious. He entered into cordial relationship with all civilized nations, and concluded treaties of friendship and commerce which gave a new impulse to business, and ushered in a new period, or industrial era, in the direction of steam-, rice-, and saw-mills.

Western knowledge he diffused by means of books, pamphlets, and proclamations, either drawn up by himself or compiled under his supervision; to many periodical publications, local and foreign, he contributed interesting articles; whilst he ardently followed the progress of human culture in the West, doing his utmost to make it popular among his subjects.

An enthusiastic admirer of European science, and at the same time a staunch and devout Buddhist, he died the victim of one of the researches in which he delighted astronomy—having, from a favourable but malarious point of the coast, observed the famous total eclipse of the sun on August 18, 1868, at the same time giving hospitality to the astronomers, whom from all parts of the world he had invited there. This great love for science cost him his life, for the malarial fever which he contracted brought him in a few days to the tomb.

The liberal work of reform and reorganization, which had been interrupted by the premature death of King Mongkut, found an enlightened and untiring continuator in his son and heir, Chulālongkorn, who during his long reign of forty-two years, at the head of the so-called 'Young Siam' party, managed, along with other innovations, to raise the economic and industrial development of his country to a position beyond the most sanguine expectation.

Having received, as has already been said, while a child

European education, and completed it by long voyages of instruction which he had taken abroad, on two occasions (1897 and 1907) having travelled even as far as Europe, with which he made a thorough acquaintance, he fully grasped all the benefits that Western science and arts would procure for his country. During his reign schools were multiplied, a museum of natural history and Siamese industrial arts sprang up, a National Library was founded, the native and European Press was widely spread, and those efficacious instruments of civilization, the telegraph and the railway, were introduced; good laws were also enacted to protect and promote industries, and among these the very important one of forestry. By means of extensive works of canalization and irrigation a vigorous impulse and extension was given to agriculture and like industries.

If during the previous reign the foundation of modern primary education had been laid, under his reign secondary education was provided for, and the way was prepared for superior schools, whilst by means of special institutions attempts were made to intensify the commercial and agrarian instruction of the masses. If King Mongkuṭ introduced European instruction in his own court, and widely promoted it among his subjects, King Chuḷālongkorṇ took a still more decisive step in advance; and while he sent his sons to perfect themselves in the principal educational institutions in Europe, he founded prize scholarships, open for competition to the most efficient pupils of the intermediate schools, giving thus the means to the less well-to-do—there being no universities and higher schools in the country—to frequent those of the West. Hundreds, therefore, of the Siamese availed themselves of this advantage to take their degrees in Europe in the various faculties, and then, returning to their own country, they diffused the culture acquired or else placed it at the service thereof. Thus for twenty years past about fifty Siamese students have been continuously frequenting different educational institutions of Europe, those leaving being replaced by newcomers, while some follow a course of instruction at the Forest Department in British India, as far as that calling is concerned, and others,

in different subjects, perfect themselves in Japan. In this way not only was it possible to form the nucleus of a competent staff for the different administrations, but also a first group of teachers for the various special schools recently instituted. The reign of the regretted monarch thus becomes identified with the decided and rapid progress of Siam, beyond other fields that do not come within the province of this brief sketch, in the essential one of the reorganization and growing development of education. For this particular result, after the much regretted king, special praise and merit are due to one of his younger brothers, Prince Damrong, who during his term as Minister of Public Instruction attended with untiring energy—as he is actually doing at the Home Office—to the arduous duty entrusted to him by the Sovereign, and who laid the foundation of the present reform in teaching.

As to the actual King Vajirāvudh, who only a few months ago succeeded his father, the fact of his having completed his studies in one of the most famed universities and in other high schools in Europe gives full guarantee that during his reign the work of his two worthy predecessors will be vigorously carried on; so that in this important direction Siam will, in the near future, be brought to the level of the most advanced nations.

Notes upon the present Educational Institutions in Siam

The primary schools of a purely lay character existing in connexion with the monasteries amount now to about the same number as these, that is to say, about thirteen thousand. They have been, however, in the majority of cases, reformed on modern lines and in a uniform manner with a minimum universal standard of teaching, and provided with school-books and educational apparatus, to this end being placed under the direct superintendence and control of the Ministry of Public Instruction. The schools belonging to this category are, as a rule, purely Siamese; in those in connexion with Peguan, Lāu, and other monasteries the language is also taught of these

particular populations, which have emigrated and established themselves in more or less remote times in Siam.

Besides these, especially in the capital and in the neighbouring towns, primary, secondary, superior, normal, art-and-crafts, agricultural, medical, and midwifery schools were founded with teachers partly European and partly Siamese, who, most of them, had perfected their studies in Europe. Although the greater number of these schools are reserved for students of the male sex, there is no want of institutions and colleges for girls, notwithstanding the fact that traditional prejudices regarding the mission of woman, which however are gradually disappearing, cause the education of girls as a rule to be still imparted within the family circle under the charge of private teachers.

Further, in order to take advantage in this period of transition of all the elements and living forces which have the aim of educating the masses, the schools, the colleges, and other educational institutes founded and directed by missionaries, both Catholic and Protestant, receive from the Siamese Government the most valid encouragement, not only in the sense that it opens the way to employment in the public administrations to the most deserving students, but at the same time it admits them in a certain measure to the competition for the prize scholarships granted for completing education in Europe, founded by the late Sovereign.

These schools, which have been founded in connexion with the Christian Missions, are numerous, not only in the capital but also in the different principal towns of the kingdom, where primary instruction is often imparted to both sexes. In the capital the above missions maintain secondary lay schools both for boys and girls, which are well frequented.

Besides the above mentioned, there are religious schools in connexion with the principal monasteries and a flourishing higher school of Pāli, Buddhist theology and philosophy in the capital; moreover, military and naval colleges and schools for the Army and for the Navy.

Statistical Data

I. Government Schools.

A. In Siamese Buddhist Monasteries.

Number of the *wats* (monasteries)	13,201
Number of the *bhikkhus* (proficient monks, of whom a good number are set aside for teaching) . .	93,366
Number of the *ṇēn* (novices), of the *śisya* (pupils living in the convent in attendance on, and under the care of, the monks), and of the *nak-rīen* (day pupils, frequenting the lay convent schools only during the day-time)	157,098

B. In Buddhist Monasteries of other Nationalities (Peguan, Lāu, etc.).

Number of pupils (for the most part *śisya* or convent pupils) of various ages	*c.* 54,000
Total .	211,098

C. In the Lay Scholastic Institutes of the Capital (Bāngkōk).

	Number of schools.	Number of pupils (girls and boys).
1. Lower and Middle Primary . .	138	10,083
2. Upper Primary, Siamese . .	4	420
3. Secondary, Siamese (science) .	2	184
4. English Schools	6	549
5. Special Schools:		
(*a*) Medical College . . .	1	108
(*b*) Training College for Teachers	1	68
(*c*) Midwifery School . .	1	32
(*d*) Chulālongkorn Civil Service College . . .	1	70
Carried forward .	154	11,514

	Number of schools.	Number of pupils (girls and boys).
Brought forward .	154	11,514
D. Special Schools connected with Ministries, other than that of Public Instruction.		
1. School of Agriculture . . .	1	about 300
2. Law School (for lawyers, judges, etc.)	1	about 200
3. Military College	1	615
4. War School (for all kinds of service up to the present) . . .	1	287
5. Naval Academy	1	206
6. Naval Engineering College . .	1	...
Total .	160	13,122

II. Schools of the Foreign Missions.

1. Catholic Mission:		
(*a*) Primary Schools (for both sexes)	61	4,060
(*b*) Secondary Schools . .	4	944
2. American Presbyterian Mission:		
(*a*) Primary Schools . .	43	about 1,000
(*b*) Secondary Schools . .	1	about 250
Total .	109	6,254

Summary.

1. Government Schools:		
(*a*) In lay scholastic institutes .	160	13,122
(*b*) In lay monasteries . .	13,201	211,098
2. Schools of the Foreign Missions .	109	6,254
General total .	13,470	230,474

N.B. The above-mentioned numbers refer to the beginning of 1910, and are to be considered, as regards the schools and pupils, somewhat below the actual figures, as precise information from the most remote parts of the kingdom, especially from the Northern Lāu districts, is wanting.

G. E. Gerini.

Memorandum on the Educational Exhibits prepared in the schools of the Siamese Education Department to be shown at the International Exhibition of Industry and Labour, Turin, 1911

In judging this exhibit it should be borne in mind that the work of organizing and developing education in Siam on modern lines was commenced only twenty years ago, and in spite of difficulties has progressed rapidly. The exhibit prepared by His Siamese Majesty's Education Department aims at showing in outline the scheme of organization of schools under the Department, the course of studies prescribed in the various grades, together with specimens of work of average merit done by the pupils in those grades.

Nos. 139–41 show in outline the plan on which the various schools are graded, together with abstracts of the courses of studies laid down for each grade. It will be noticed that, in addition to the schools providing for general education, the Department has also under its control the Medical College, the Training College for Teachers, and the Commercial School. Other technical schools and colleges (e.g. the Military and Naval Colleges) are attached to the departments which they severally serve. Nos. 142–51 give the time-tables of work in the various grades of schools. Nos. 152–76 show an interesting collection of photographs of (*a*) typical schools and class-rooms, and (*b*) of classes at work and exercise. Nos. 177–202 consist of textbooks in general use in the various grades.

Nos. 203–40 (*c*) are specimens of work done by the boys and girls in the ordinary schools devoted to general education. For the purposes of this Exhibition it was decided to make a special feature of the drawing exhibit, as representing an art for which the Siamese have great natural aptitude and which is likely to develop greatly in the future. This exhibit of drawings is a selection of average merit from work done in the schools of His Siamese Majesty's Education Department.

It aims only at representing drawing as a school subject in the courses followed in general education :

(1) In Elementary and Secondary Day Schools.
(2) In the Training College for Teachers.
(3) In the Evening Continuation Classes provided for teachers.

The system followed is one of working from nature and common objects ; also practice in design based upon nature studies and on the study of Siamese historic ornament. Drawing from copies is discouraged. The students in training and teachers pay special attention to blackboard drawing.

The R. Education Department.

Garuḍa, the mythical king of birds, in the act of grasping two *nāgas* (serpents).

GROUP I

Education

CLASS 3

Commercial Teaching

Serial No.	Exhibitor.	Description of Exhibits.
1	Education Department	Primary schools—1st year.
2	,, ,,	,, ,, 2nd ,,
3	,, ,,	,, ,, 3rd ,,
4	,, ,,	,, ,, 3rd ,,
5	,, ,,	Intermediate schools—1st year.
6	,, ,,	,, ,, 1st ,,
7	,, ,,	,, ,, 2nd ,,
8	,, ,,	,, ,, 3rd ,,
9	,, ,,	,, ,, 3rd ,,
10	,, ,,	,, ,, 3rd ,,
11	,, ,,	,, ,, 3rd ,,
12	,, ,,	Higher schools—1st and 2nd year.
13	,, ,,	,, ,, ,,
14	,, ,,	,, ,, ,,
15	,, ,,	,, ,, ,,
16	,, ,,	Freehand drawings from nature.
17	,, ,,	,, ,, ,,
17*a*	,, ,,	,, ,, ,,
18	,, ,,	Model drawing from groups of models, and from objects of everyday use.

Serial No.	Exhibitor.	Description of Exhibits.
19	Education Department	Model drawing from groups of models, and from objects of everyday use.
20	,, ,,	Design based on freehand studies.
21	,, ,,	,, ,, ,,
22	,, ,,	,, ,, ,,
23	,, ,,	,, ,, ,,
24	,, ,,	,, ,, ,,
24*a*	,, ,,	Specimens of blackboard drawing, to which special attention is given.
25	,, ,,	Freehand from nature.
26	,, ,,	,, ,,
27	,, ,,	,, ,,
28	,, ,,	,, ,,
29	,, ,,	,, ,,
30	,, ,,	,, ,,
31	,, ,,	Model drawing.
32	,, ,,	,,
33	,, ,,	,,
34	,, ,,	,,
35	,, ,,	,,
36	,, ,,	,,
37	,, ,,	,,
38	,, ,,	,,
39	,, ,,	,,
40	,, ,,	,,
41	,, ,,	,,
42	,, ,,	Elementary design, space-filling, etc.
43	,, ,,	,, ,, ,,
44	,, ,,	,, ,, ,,
45	,, ,,	,, ,, ,,
46	,, ,,	,, ,, ,,
47	,, ,,	,, ,, ,,

Serial No.	Exhibitor.	Description of Exhibits.
48	Education Department	Elementary design, space-filling, etc.
49	,, ,,	,, ,, ,,
50	,, ,,	,, ,, ,,
51	,, ,,	,, ,, ,,
52	,, ,,	,, ,, ,,
53	,, ,,	,, ,, ,,
54	,, ,,	,, ,, ,,
55	,, ,,	,, ,, ,,
56	,, ,,	Freehand from nature (outline and tint).
57	,, ,,	,, ,, ,,
58	,, ,,	,, ,, ,,
59	,, ,,	,, ,, ,,
60	,, ,,	,, ,, ,,
61	,, ,,	,, ,, ,,
62	,, ,,	,, ,, ,,
63	,, ,,	Drawing from nature and common objects in pencil and water-colour.
64	,, ,,	,, ,, ,,
65	,, ,,	,, ,, ,,
66	,, ,,	,, ,, ,,
67	,, ,,	,, ,, ,,
68	,, ,,	,, ,, ,,
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77	,, ,,	,, ,, ,,
78	,, ,,	,, ,, ,,

Serial No.	Exhibitor.	Description of Exhibits.
79	Education Department	Drawing from nature and common objects in pencil and water-colour.
80	,, ,,	,, ,, ,,
81	,, ,,	,, ,, ,,
82	,, ,,	Model drawing as an aid to a knowledge of the effects of perspective on form.
83	,, ,,	,, ,, ,,
84	,, ,,	,, ,, ,,
85	,, ,,	,, ,, ,,
86	,, ,,	,, ,, ,,
87	,, ,,	,, ,, ,,
88	,, ,,	,, ,, ,,
89	,, ,,	,, ,, ,,
90	,, ,,	,, ,, ,,
91	,, ,,	,, ,, ,,
92	,, ,,	,, ,, ,,
93	.. ..	.. .. ..
94	,, ,,	Design, space-filling, borders, etc., applied to design for special purposes.
95	.. ..	.. .. ..
96	,, ,,	,, ,, ,,
97	,, ,,	,, ,, ,,
98	,, ,,	,, ,, ,,
99	,, ,,	,, ,, ,,
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104	,, ,,	,, ,, ,,
105	,, ,,	,, ,, ,,
106	,, ,,	,, ,, ,,
107	,, ,,	.. .. ..

Serial No.	Exhibitor.	Description of Exhibits.
108	Education Department	Design, space-filling, borders, etc., applied to design for special purposes.
109	.. ,,	,, ,, ,,
110	.. ..	Drawing hands from life.
111	.. ,,	,, ,, ,,
112	.. ,,	,, ,, ,,
113	.. ..	Drawing groups, etc., in water-colour.
114	.. ,,	,, ,, ,,
115	.. ,,	,, ,, ,,
116	.. ..	.. .. ..
117	.. ,,	,, ,, ,,
118	.. ,,	Sketching in pencil and water-colour.
119	.. ..	,, ,, ,,
120	.. ,,	,, ,, ,,
121	.. ,,	,, ,, ,,
122	.. ..	.. .. ..
123	,, ,,	Studies and designs based on Siamese historic ornament and architecture.
124	.. ,,	,, ,, ..
125	.. ..	,, ,, ,,
126	.. ..	,, ,, ..
127	.. ..	,, ,, ..
128	.. ,,	,, ,, ..
129	.. ,,	,, ,, ..
130	.. ,,	,, ,, ..
131	.. ,,	,, ,, ..
132	.. ,,	,, ,, ..
133	.. ,,	,, ,, ..
134	.. ,,	,, ,, ,,
135	.. ,,	,, ,, ..
136	.. ,,	,, ,, ,,

Serial No.	Exhibitor.	Description of Exhibits.
137	Education Department	Studies and designs based on Siamese historic ornament and architecture.
138	,, ,,	,, ,, ,,
139	,, ,,	Abstract of courses.
140	,, ,,	,, ,,
141	,, ,,	,, ,,
142	,, ,,	Time-table, Lower Primary School (boys).
143	,, ,,	,, Middle Primary School (girls).
144	,, ,,	,, Middle Primary School (boys).
145	,, ,,	,, Upper Primary School (boys).
146	,, ,,	,, Primary English School (boys).
147	,, ,,	,, Secondary School (boys).
148	,, ,,	,, Secondary School (girls).
149	,, ,,	,, High School.
150	,, ,,	,, Training College for Teachers.
151	,, ,,	,, Medical College.
152	,, ,,	Photograph of Arts and Crafts School.
153	,, ,,	,, of Dining Hall, Training College.
154	,, ,,	,, of Training College.
155	,, ,,	,, of Dormitory.
156	,, ,,	,, of Critical Lesson, Training College.
157	,, ,,	,, of Midwifery Class.
158	,, ,,	,, of Physics Class.

Serial No.	Exhibitor.	Description of Exhibits.
159	Education Department	Photograph of Gymnastic.
160	,, ,,	,, of Football Field.
161	,, ,,	,, of Physical Drill, Beñchama.
162	,, ,,	,, of Sawaph'ā School.
163	,, ,,	,, of Thēpsirindra School.
164	,, ,,	,, of Bop'hit-p'himukh School.
165	,, ,,	,, of Rājinī School.
166	,, ,,	,, of Needlework Class, Satrī School.
167	,, ,,	,, of Flower-work Class, Satrī School.
168	,, ,,	,, of Weaving Class, Satrī School.
169	,, ,,	,, of a *Wat* (Monastic) School.
170	,, ,,	,, of Collective Lesson.
171	,, ,,	,, of a Private School.
172	,, ,,	,, of Operating Theatre, Medical College.
173	,, ,,	,, of Medical College.
174	,, ,,	,, of Hospital Ward, Medical College.
175	,, ,,	,, of Beñchama School.
176	,, ,,	,, of High School.
177 202	,, ,,	Textbooks generally used in the various grades.
203	,, ,,	Arithmetic, Handwriting (Lower Primary boys).
204	,, ,,	Accounts, Algebra.
205	,, ,,	Dictation, Handwriting.
206	,, ,,	Map-drawing.
207	,, ,,	Geometry, Letter-writing, Specimen Notebook in Physics.

Serial No.	Exhibitor.	Description of Exhibits.
208	Education Department	Mechanics, Trigonometry.
209	„ „	Accounts.
210	„ „	Notes of a lesson, History.
211	„ „	Chemistry, Anatomy.
212	„ „	Artificial Flower.
213	„ „	Embroidery Cushion.
214	„ „	Tablecloth.
215	„ „	„
216	„ „	Silk P'hā-nàng.
217	„ „	Cotton „
218	„ „	Bathing Cloth.
219	„ „	Serviettes (2).
220	„ „	Small Tablecloth.
221	„ „	Velvet Cushion.
222	„ „	Embroidery Slippers.
223	„ „	Velvet Cushion.
224	„ „	„
225	„ „	Baby's white Shawl.
226	„ „	Pink Shawl.
227	„ „	Velvet Cushion.
228	„ „	Baby's woollen Socks.
229	„ „	Silk Embroidery Design, Sawap'hā School.
230	„ „	Bead Chains (7).
231	„ „	Embroidery, Blotting-pads (4).
232	„ „	Doilies (12).
233	„ „	Silk Handkerchiefs (12).
234	„ „	Embroidery Slippers (4).
235	„ „	Embroidery Photo Frame.
236	„ „	„ „ „
237	„ „	Artificial Flower (2 boxes).
238	„ „	Embroidery on silk.
239*a*	„ „	„ „
239*b*	„ „	Cushion.
239*c*	„ „	„

Serial No.	Exhibitor.	Description of Exhibits.
239*d*	Education Department	Cushion.
240*a*	,, ,,	Hand-painting on silk (School).
240*b*	,, ,,	,, ,, (Pagoda).
240*c*	,, ,,	,, ,, (Historical Description).

Siamese panel.

GROUP III

Photography and its Applications

Retrospective Notes

THE Daguerrotype made its first appearance in Siam through the agency of missionaries and European diplomatic envoys soon after 1851. The liberal, nay radical, King Mongkut, who had then just ascended the throne, early contributed by his own example to dispel the antiquated superstition rooted in almost all the Oriental world, according to which portraits may afford to adepts of the black art the means of perpetrating incantations to the damage of the person whose likeness is represented. To portray others was therefore suggestive of *envoûtement* and severely punished by law, in certain cases even with death. Up to more recent times the non-existence of coins bearing the effigy of the sovereign, and the absence of portraits of personages of bygone epochs in Brāhmaṇic India and in the countries which like Siam have adopted its institutions, must be ascribed to the baneful influence of that superstition. In Siam it was solely due to the liberal-minded King Mongkuṭ that effigiated coins appeared for the first time, and that first photography and then pictorial art could at last portray the sovereign and the court dignitaries.[1]

[1] The only known breach of the old rule occurred in connexion with the Siamese ambassadors who visited France in 1686, whose portraits painted there are still preserved in the Versailles picture gallery. Being mostly well-travelled men, they had probably imbibed enough of Western ideas to overcome the national aversion in the matter, or else they agreed to sit before the French Court painter merely out of courtesy towards the great monarch.

Once the old superstition had been done away with,[1] photography in Siam progressed rapidly, and soon there sprang up studios and laboratories through the enterprise of natives, who had quickly learnt the art. At Court this has ever since been cultivated with great assiduity and marked success, especially after the late King Chulālongkorn and some of his brothers devoted themselves to it with enthusiasm, promoting its diffusion and higher development by means of competitions and prize contests. During the last few years in particular (1903-10) the photographic competition has always formed an item of the programme of the annual festivals held at the Royal Villa (*Dusit Park*) to celebrate the King's birthday.

Thanks to such high and liberal patronage accorded to photographic art in Siam, amateur photographers of conspicuous ability may now be counted by thousands in that nation. If the professionals are but few, it is due to the keen competition of local European firms of ample means and not common capacity.

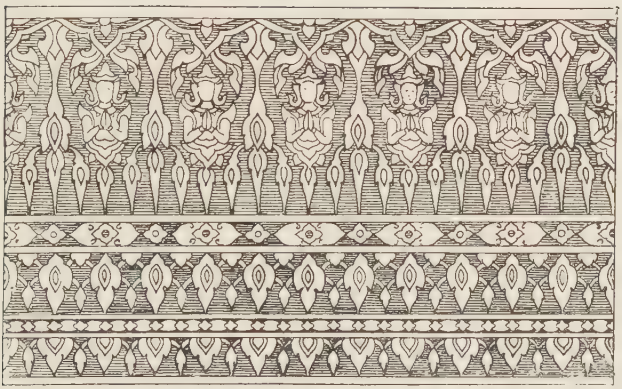
As regards Class 18, the reproduction of topographic maps and designs by photographic processes was introduced only some fifteen years ago into the offices of the Royal Survey Department, to which it had been until recently restricted. Several Siamese have now specialized in this branch as well as in photogravure, and as a result local geographical and topographical maps have since been printed in the country. Specimens of such works figure at the present Show, as also, for comparison, some cartographic cimelia of past epochs.

The introduction of modern geodetic and topographic methods in Siam dates from 1867, in August of which year extensive survey operations of some provinces were commenced. At the same time, a systematic survey of the country, based on a real geodetic triangulation, was not started till after the foundation

[1] It is interesting to observe, while on this subject, how it was only in January, 1908, that the Western world learnt with wonder from Constantinople that the Sultān (now deposed) had finally consented to have his photograph taken for the first time after thirty-three years reign, in antagonism to the religious prejudices of his own nation, to which he thus set a precedent in this new departure. The taking of another's likeness appears, in fact, to be forbidden in the Kurān.

of the Royal Survey Department in 1883, which now, however, occupies itself merely with the cadastral survey, while the geodetic, topographic, and cartographic operations were transferred last year (1910) to the Military Geographical Service of the Army.

G. E. Gerini.



Part of Siamese Frieze with *Thèp Pranom* (angels with joined hands)figures.

GROUP III

Serial No.	Exhibitor.	Description of Exhibits.
	Class 16. Artistic Photography.	
241	Lenz & Co., Robert . .	Photo of His late Majesty King Chulālongkorn.
242	,, ,, . .	Photo of H.M. King Vajirāwudh.
243	,, ,, . .	Photo of the Queen-Mother.
244	Döhring, K., Esq. . . .	Photographs of Siamese decorative work.
	Class 17. Colour Photography.	
245	Duke, A. H., Esq. . . .	Seven autochromes (views of Siamese life and landscape).
	Class 18. Maps reproduced by Photographic Processes and Photogravures.	
246*a*, *b*	Survey Department, Royal	Old Siamese maps.
247*a*–*f*	,, ,, ,,	Present-day maps.
248*a*–*g*	,, ,, ,,	Photogravures.

GROUP VI

Public Works

Retrospective Notes

FROM the very first centuries of the Christian era the art of building in Siam unfolded itself, especially in monuments dedicated to the Brāhmaṇic and Buddhist worship, of which splendid specimens still exist—more or less well preserved—among the ruins of the ancient capitals.

In the northern parts of the country where stone is plentiful, either on the surface of the earth or among the hills, such buildings were erected—as also the city walls—in a Cyclopean style, with enormous masses of reddish laterite superposed in horizontal layers, without any mortar or cement, culminating, in the case of the temples, in pointed roofs of a more or less acute Gothic form, and in the pagodas and reliquaries in slender, conic, or pyramidal spires, embellished, all of them, by archways, balustrades, friezes, and symbolical carvings of greyish or greenish sandstone, of very pleasing effect. In the southern parts of the country, which are mostly of alluvial formation, from the earliest times brick buildings predominated, while stone was only used in some cases in blocks, and sparingly, in terminals, friezes, capitals, and statues.

The architectural style, derived from Southern India, is, in the above-mentioned buildings, much the same as in those best known and so much admired, which were erected at about the same period in the neighbouring Kamboja. But in Siam, after the arrival of the Thai, who swayed supreme there from 1250 onwards, the style went on changing under the influence of

the genius of this race of marked artistic attitudes, specially in the line of decorative art; and thus it assumed the elegant and gorgeous character which is so much admired by strangers in the religious buildings and royal palaces of the present time.

In the other buildings not used for worship or for defensive purposes the material generally employed, up to a few centuries ago, was wood, as may well be understood, considering the abundance of timber of excellent quality and suitable for building purposes found in the country. The best kind is teak, used for its remarkable elasticity and resistance to any kind of weather in beams, walls, floorings, pavements, doors, and windows; *teng* (*Pentacme siamensis*) and *rang* (*Shorea robusta*), used for posts for supporting the roofs, and the piles on which the ground-floor pavement rests (always somewhat raised from the ground for healthiness); and *tabĕk* (*Lagerstræmia regina*), resorted to in interiors for trusses and floors. Many other kinds of wood there are, for which the reader is referred to the note prefixed to Group XV in the present Catalogue; let it suffice here to mention only the indispensable bamboo, used in Siam from time immemorial for all parts of rustic dwellings from roof to floor, and also for the rafts which support the many floating houses along the banks of the rivers and creeks.

The Siamese from an early date turned to good account this abundance of excellent timber, and very quickly distinguished themselves in the use of it for decorative purposes, embellishing it with carvings, inlayings, lacquerings, and gildings of the finest workmanship and exquisite artistic taste. But also in the employment of it in a rough-shaped form the Siamese obtained pretty effects in buildings of a rustic character as turrets and steeples, cloisters and country shrines, gateways, etc. Municipal building, in addition to the above-mentioned constructions, manifested itself also in bridges, especially necessary in the deltaic southern districts, intersected by innumerable streams and canals, both natural and artificial. Both the ancient capital Ayuddhyā and the modern Bāngkōk, which followed it—compared by the European travellers who visited them, because of the numerous canals, to Venice and

Stockholm—had hundreds of bridges,[1] which were either in wood or in brickwork, but which in Bāngkōk, since some twenty years ago, were replaced by modern and elegant ones of iron and ferro-concrete.

The excavation of canals for the opening of new routes to navigation in the interior of Siam dates many centuries back, as we find it mentioned in the local chronicles from the thirteenth century onwards. Later on numerous works of the same kind were undertaken with the purpose of irrigating extensive districts still uncultivated and of transforming them specially into rice-fields. The necessity of such works made itself greatly felt after commercial treaties had been concluded with European nations (1855-60), one of the immediate results of this being an immense increase in exports, especially of rice: so much so that it became at times necessary to put a check on it in order to prevent eventual famines in the country. It is thus that during the last fifty years, for this purpose, hundreds of kilometres of new canals have been dug and thousands of square kilometres of barren land have been brought under cultivation. For further details on these works see Group VIII, Class 46.

Whilst from the very earliest days some buildings were erected in Siam, either for religious purposes or for mere curiosity, in Chinese style, European architecture was not introduced there until after the advent of the Portuguese in the sixteenth century. But it was only after the middle of the following century that the latter attained considerable development, intensified even more as a result of the cordial relations that soon were established with Louis XIV of France.

[1] La Loubère (1687) thus describes Ayuddhyā (*Historical Relation of the Kingdom of Siam*, London, 1693, p. 6): 'The streets thereof are large and straight . . . and paved with bricks laid edgewise . . . Most of the streets are watered with straight canals, which have made Siam [i.e. Ayuddhyā] to be compared with Venice, and on which are a great many small bridges of hurdles, and some of brick very high and ugly.' In 1690 Kaempfer remarked when visiting the same capital: 'Les canaux ont donné lieu à un grand nombre de ponts. Ceux qu'on a bâti sur le grand canal sont de pierre [read *masonry*], avec des balustrades de même; mais comme il n'y a ici ni chariots, ni charrettes, ils sont fort étroits; il sont quatre-vingt pas de long et sont fort hauts au milieu: mais ceux des petits canaux écartés sont sans ornement, et la plûpart de bois.'

Under the supervision of engineers sent by the 'roi le plus oriental de l'Occident', as Mirabeau defined this monarch, palaces and villas, aqueducts and fortifications, bridges and roads, were built in considerable numbers, and still more vast would have been the progress made if that *entente cordiale* had lasted a longer time. Nevertheless, in the period that followed, the Siamese did not fail to take advantage of the instruction they had then received in civil engineering. But the fall of the capital Ayuddhyā into the enemy's hands in 1767 paralyzed for several decades every economical and industrial development, and it was not until after the middle of the last century that real public works, according to European methods, were again taken up both outside and inside the new capital Bāngkōk.

From 1876 onward they received a remarkable and genial impulse through Italian engineers and architects, who erected palaces, barracks, villas, and many other buildings both for public and for private use, of such boldness and elegance as to awaken general admiration.

In order to give a greater impetus to the edilic renovation of the country, according to the principles of modern art, in 1887 a Ministry of Public Works was formed, with a Technical Bureau which from 1890 has been under the directorship and has consisted entirely, except in some secondary capacities, of Italian engineers and architects. Besides the capital, as regards monumental buildings (the bridges and roads of Bāngkōk having been since 1902 entrusted to the Municipal Engineering Office), the Technical Bureau extends its supervision to the public works of the provinces, in some of which it has already established branches controlled by district engineers and edilic superintendents of its own.

In this manner hundreds of kilometres of carriage roads were opened in place of the old winding tracks that could only be used for primitive native bullock and buffalo carts; numbers of bridges and culverts were laid across canals and other waterways, which before could only be crossed by boats or at fords; and every inland town was supplied with convenient quarters for administration and public services. The indefatigable work

still continues, intensified and ever increasingly extended towards the remotest corners of the country.

At the present time the technical staff of the above-mentioned bureau numbers twenty-two officials of the following nationalities: seventeen Italians, four Siamese, one Japanese (draughtsman), and divided as follows:

(1) *Engineering Section.* Eight engineers, namely, one engineer-in-chief, one superintending engineer, three district engineers, and three belonging to the Central Office.

(2) *Architectural Section.* Eight architects and one sculptor, all belonging to the Central Office.

The experiments which this Technical Bureau has recently made are remarkable, as much for the good results obtained as for their novelty, and include those relating to the application of ferro-concrete to the manufacture of screw-piles for foundations, of piping for aqueducts and sewerage, which are to be had in all sizes and thicknesses, of small posts for supporting lamps and electric lights, etc.

Of such flattering results the Technical Bureau shows examples in the present Exhibition, together with photographs of the principal monumental works it has erected.

The province of Nagara Śrī Dharmarāja (commonly called Lakhōn or *Ligor*) exhibits on its own account samples of tiles, industrial products which are increasingly being used in Siam in the modern buildings, while in the past they were limited—especially in the case of the enamelled tiles occurring in the parti-coloured roofs which form such a pleasing characteristic of the Siamese temples—to a small number of sumptuous structures.

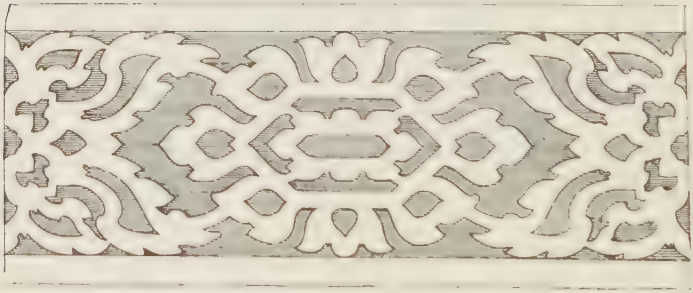
The characteristic feature of the Siamese tiles is their flat and pointed shape. This imparts to the roofs a scaly appearance of pleasing effect, which in those with enamelled tiles reminds one of the metallic reflections of a fish—gold, green, or blue. Nevertheless, the fragility of the common tiles, owing to their thinness and other causes, makes those manufactured according to modern European methods preferable, especially those of cement, despite their greater cost.

The terra-cotta industry of Siam had in the past one of its

principal centres in the vicinity of the ancient capital Ayuddhyā, especially at Sraḥ Būa, where a soft tenacious clay of glassy brightness, mixed with the sand of the river, makes an excellent material for roofing or flooring tiles. Not far from it, at Sǎm-khôk, a numerous Peguan colony, established there from the sixteenth century, devoted itself to the manufacture of bricks and water-jars, which for their excellence soon became famous on the market.

But for more than twenty years manufactories of terra-cotta with European machinery and improved kilns have arisen in good number in those places, and lower down stream towards the present capital Bāngkōk, by local initiative.

G. E. Gerini.



Part of Siamese panel.

List of Exhibits

GROUP VI

Serial No.	Exhibitor.	Description of Exhibits.
	Class 35. Building Materials.	
249	Nagara Śrī Dharmarāj, Province of	One set of tiles.
	Class 37. Models, Plans, and Drawings.	
250-99*a*	Public Works Department	Photos of buildings and bridges erected and in concrete construction.
299	A. Rigotti, Esq., architect	Architectural sketches of Siam.

Round panel with *nāga* figures (mythical serpents).

GROUP VII

Means of Transport

CLASS 38

Conveyances for ordinary roads ; animal-driven Vehicles

Descriptive Notes

THE means of land transport which were exclusively used in Siam till the introduction of tramways (1888), of railways (1893), and of motor-cars (1898), although somewhat primitive, are interesting to notice, some of them being very ingenious and almost unknown to us. Leaving aside sedan chairs, palanquins, etc., which did not find so much favour in Siam as in China, even in the past, as means of transport and locomotion, and which even to-day do not appear except very rarely in great State ceremonies, the means of transport characteristic of Siam are—

I. Beasts of burden
  1. The elephant (*C'hāng*).
  2. The pack-bullock (*Ngūa Tāng*).

II. Vehicles
  3. Bullock-carts } roofed or not.
  4. Buffalo-carts }
  5. Drays or paddy-sleds, *Rathĕḥ* (for carrying paddy).
  6. Mud-sleds (*Kadān Hōi*).

A few brief notes will be sufficient on numbers 1, 2, 4, 5, and 6, which do not appear in the present Exhibition.

The elephant is the most useful beast of burden, especially where ways of communication are either wanting or rudimentary, and where there are bogs or watercourses which have to be

crossed. It is for the jungle of India and Siam what the camel is for the desert, a truly providential means of transport.

The male elephant travels from 4 to 5 km. an hour, and carries besides the driver a load from 100 to 150 kg., or as many as five persons, according to the more or less difficult state of the roads and the system of trappings. With rationally improved harness and nourishing food, as are adopted in British India, it could carry as much as 250 kg. on moderately good roads. The female walks faster, but carries a smaller load. The system followed in Siam is: having arrived at the evening halting-place, to leave the elephant free to feed all night, putting hobbles on it, however, consisting of two strong rings of rattan tied close together, so as to prevent it from wandering too far away. Early in the morning it is brought in again to be harnessed and loaded before starting.

The Siamese hunchbacked pack-bullock, although small, is very serviceable for crossing difficult country or hill tracts where there are only narrow and steep trails, inaccessible to carts. It only carries a load of from 50 to 60 kg. in two baskets suspended on its sides, walking quickly through narrow lanes where even our mules could hardly pass, and it can cover regularly from 30 to 35 km. a day.

These are the only beasts of burden that exist in Siam; the pony is not included in this category, it being by nature of but little use for such work. In the extreme north, that is, in the Lāu country, Yünnanese merchants are often met with leading large caravans of mules coming from the South of China; but the mule is not an animal belonging to Siam, and still less is the ass—at any rate, the four-footed kind.

Among the vehicles, after the carts, which will be mentioned further on, the dray must be noted, a kind of sled, on which paddy, stubble, etc., are transported from the fields to the houses.

But the most interesting vehicle for its originality is, beyond doubt, the mud-sled, employed in some muddy tracts on the north-eastern shore of the Gulf of Siam, which during the low tide remain uncovered. These sleds are used for conveying from one point to the other of the coast those who gather

molluscs and shell-fish; this would be impossible with any other kind of vehicle, which would at once sink. The sled is made for one person only, and consists of a strong plank of wood from 2·50 to 3 metres in length by 0·35 to 0·40 metres in width, terminating in front with a curved-up tip. It has thus the appearance, on account of its shape, of a gigantic ski, but the way to use it is by taking a kneeling posture upon it (in military style, that is, with one knee only on the board) and pushing the sled forward by means of a paddle or a pole. The traveller has in front of him a basket tied to the fore end of the sled, where he carries what he has with him, or deposits the molluscs, shell, and other fish which have been left behind by the tide and which he gathers on his way. As far as the writer—who sent one of such sleds to the Section for means of transport in the Milan Exhibition of 1906—is aware, this means of locomotion, which he claims to have first made known in Europe, does not exist elsewhere than on the Gulfs of Siam and Tong-king.

The bullock-carts, and the larger ones for buffaloes, which are seen in Siam, are very interesting because of their original construction, being entirely of wood without a single nail, screw, or any bit of metal whatsoever. It is surprising and worthy of study how the Siamese have, many centuries before us, in a natural and simple way, but admirably suited to the peculiar topographic character of the country, solved two of the most ancient problems which have troubled our technical men, inventing for the cataracts of their rapid rivers a type of unsinkable boat, and for their primitive roads, just tracks through the forests, a type of cart as it were unbreakable, and always brand-new, notwithstanding the horrible unevenness of the road, through which no European vehicle, even with its framework of the best steel, could resist for more than a few hours. This is in fact, in its primitive simplicity, the wonderful Siamese cart. The trunk and the wheels are of wood, accurately chosen on account of its elasticity and rigidity, toughness and resistance, which are necessary in all its parts; and of wood moreover are the axle-trees, of which, like the wheels, there are two, one on each side. The pieces are fastened together by pegs

and bolts of very hard wood, or by mortises and tenons, which are held together by strong bindings of rattan.

By a like method also the yoke is attached to the pole. A pair of bullocks or a pair of buffaloes, according to the size and style of the cart, are yoked on to it, and the load being completed the vehicle is guided through the forest and rice-fields, torrents and ravines, wooded slopes, and plains thick with undergrowth, always tottering, either with tremendous shocks clashing against trunks of trees, slipping over big roots which are lying across the way, jolting into the deep ruts in the road, or sinking to the naves in wide holes or muddy pools. And insomuch as no comfort of lubricant is granted to the dry axles, their continual friction in the naves produces a screeching which is heard miles away, and which constitutes the characteristic announcement of its presence to the wayfarers scattered about in the solitude of the endless jungle, or of its approach to the inhabitants of the far-away hut or country village. And what a piercing shrill screeching! Quite enough to defy the Spanish carts described by Cervantes and Baretti, which in comparison would seem to pipe sweet melodies worthy of operette composers of the new school. Thus does the Siamese cart proceed undaunted on its wild way, swaying, creaking, and screeching in the most acute tones, the only viaticum against the accidents of the road being a few coils of rattan and a pair of small, red, very hard sticks, mostly of *sakhrō* (*Melaleuca trijuga*) wood, which are the reserve axles, like the extra tires, etc., which the modern motor-cars carry with them.

Is a smash heard, does something give way suddenly? The driver stops the vehicle, if perchance it has not stopped itself; he examines the damage, and if some part has become unserviceable he takes out his jungle knife, which he always carries with him, and goes into the forest to cut a piece of wood of the needed quality, and in a few moments he reduces it into the shape required. Some finishing touch if necessary, a binding with rattan, and the repairs are completed; the vehicle proceeds on its way. So *ad infinitum*, till exhaustion, not of the cart, but of mother jungle, from which, as Antheus

from mother earth, it draws new life every time it finds itself disabled.

Such is the Siamese cart, destined perhaps one day to disappear with the improvements of land traffic, replaced by more spacious vehicles constructed according to modern requirements; but up to the present it represents the only possible wheeler for travelling, and for agricultural and commercial transport, in districts which are not yet provided with proper roads in the sense that we understand them. It is this that makes it so valuable to the Siamese countryman, a fact which is recognized by local custom, so that a young peasant before setting up house must prove his ownership of one of these carts, besides a pair of oxen or buffaloes, in order to inspire the necessary confidence as to his capacity to earn a livelihood. The cart, therefore, establishing even among the country people a criterion of distinction between the proprietor and the poor man, plays an important part in social life.

Notwithstanding this there is an inconvenience in its use for long journeys, caused by the different widths of the gauge, which unfortunately is not the same in every province, and owing to the primitive roads along which the Siamese cart runs being deeply rutted by the wheels of carts of the same kind, they are not accessible to vehicles of different gauges.

The general and prevalent width of the latter is of 1·50 metres. The ruts are sometimes cut into the ground as deep as fifty or more centimetres, and as the road-level between them, far from being smooth and free, is generally thick with grasses and full of protuberances formed by branches and roots, sometimes of big trees which grow up at the roadside, the wheels are made 2 metres in diameter, so that the bottom of the cart and the naves remain sufficiently raised above the level of the road to allow them to pass.

The carts used in Siam may be classified into three types—

(1) Light bullock-carts for travelling (in Siamese *kathĕ̄ḥ*).

(2) Bullock-carts for transport (in Siamese *kīen*).

(3) Buffalo-wagons for transport (in Siamese *lō̄*).

Each of these kinds may be roofed or not. In the first case the covering is barrel-shaped and extends along the whole body

of the cart, and even considerably beyond the two extremities, like a hood to shelter from bad weather, not only the load, but also the driver.

As regards material the cover may consist of a netting of bamboo laths, sandwiched with palm or screw-pine leaves; but for carts carrying valuable loads which require to be well sheltered, as for example rice and such like, the cover is made of a thick texture of stripes of rattan, on which the thorns of the prickly plants which line the side of the road cannot take hold, but slide over its smooth surface. The cover is made of a slightly tapering shape with a view to pushing aside the branches which are overhanging or protruding towards the middle of the road, thus forcing its way through the thick pigmean vegetation and undergrowth of the woods.

The light bullock-cart, covered or not, corresponds more or less, by the way in which it is used, to our dog-cart. The bullocks that are yoked to it are generally swift, and on level tracts are capable of accomplishing long distances, even mile after mile, as quickly as ponies. They are therefore greatly prized, and prove very useful for quick travelling to those who, although provided with mounts, have luggage to carry with them. In festive seasons, from time immemorial in the country, races with these light carts are held, encouraged by prizes and by the gathering of great crowds. But whether it be in racing competitions or on business, the pleasure of travelling in such carts on roads of the old system may be compared to that which would be experienced on a horse artillery gun charging down the most dangerous slopes.

The bullock-cart for transport is naturally stronger and heavier, and it is that which is to be seen at the present Exhibition in two models (Class 38, Nos. 300, 301), one representing the covered kind and the other the uncovered. On account of the axles of wood, although very hard, it carries generally a weight not above 300 kilos. Its rate of speed varies from 4 to 4⅛ km. an hour.

The buffalo-wagon is somewhat larger and stronger, so as to carry a load of 500 kilos and more. But the pace of these robust animals is somewhat slower than that of the oxen

(3 km. an hour), and they are much affected by the heat, so that in the warm hours of the day it is indispensable for them to get into shady pools, where they can refresh and bespatter themselves with mud, and so defend themselves from the insects that constantly vex them. It is therefore impossible to employ buffaloes in arid plains where no water-pools can be found for them to bathe in.

The Elephant.—The elephant of Siam is of the Asiatic variety and lives in the wild state in great herds in most parts of the country, whence in determined periods, by means of enormous drives, they are led by force into enclosures made of huge logs disposed in a V shape. Herein, with the help of domestic elephants trained for the purpose, the young elephants, already fit for work, are caught and taken into captivity to be tamed, while the others are set free.

One of the most interesting scenes (unique of its kind), which anyone visiting Siam should not fail to witness, is that of the elephant hunt, which takes place every three or four years, in the presence of the king, at the kurral, near the old capital Ayuddhyā, where as many as 400 and 500 wild pachyderms are driven in from the neighbouring provinces.

The grown-up male elephant in Siam sometimes reaches 3 metres in height and more, and amongst the magnificent tusks shown in the Royal Museum of Bāngkōk there is one 3·20 metres in length (measured along its outer curve), and 40 centimetres in circumference. Another one, rather shorter (2·30 metres), is, however, somewhat thicker, having the remarkable maximum circumference of 51 centimetres.

As a traction animal the elephant renders invaluable services in the woods and in the saw-mills, where its great intelligence, coupled to an enormous strength, manifests itself in the most admirable way, in drawing logs and sawn beams, in heaping planks, etc. (see photographs exhibited, Group XV, Class 80). This will always render the elephant indispensable in the forest industry, even if the motor-car and railway were to render it unnecessary as a beast of burden.

While on this subject it will be of no little interest to recall that in 1866 an attempt was made to acclimatize the Siamese

elephant in the American United States by the initiative of King Mongkuṭ, the grandfather of the present Sovereign. Plainly perceiving the immense advantages which the noble pachyderms would have afforded to the forest industry of that nation, if it had been possible to acclimatize them, he sent a couple of elephants to General Grant, with the intention of promoting reproduction there. But whether on account of the difficulty of the climate, or for other causes, the attempt failed. King Mongkuṭ also sent two splendid elephants (male and female) to Napoleon III, with the embassy that reached Paris in May, 1867. They were transferred to the Jardin des Plantes, and not improbably survive there to this day.

The number of domestic elephants employed nowadays in Siam for industrial purposes, or as a means of transport, is about three thousand. Many of them are exported yearly to the neighbouring states, especially to Burmah, for work in the forest and in the saw-mills.

The very rare and much-prized albino-elephant is a fancy animal, the possession of which is a royal prerogative, and therefore it is only to be seen in the stables of the Royal Palace.

The Bullock.—The bullock is found in a wild state in Siam, and it is of at least two varieties—the *gaṛo* or *seladang*, in Siamese *ngŭa p'hlōḥ* (*Bos Gaurus*), and the *banting*, in Siamese *ngūa dĕng* (*Bos Sondaicus*), which are to be found, among other places, in the woods near the coast of the gulf, and in the northern part of the Malay Peninsula which belongs to Siam. They have beautiful curved horns, capable of taking a fine polish, and which are much sought for as an ornament for waiting-rooms, as clothes-pegs, etc.

The domestic bullock is hunchbacked and of the same variety as the Indian. It is used, as has already been said, as a beast of burden and for draught; it is also exported in considerable numbers (61,150 heads in 1910) to Singapore and other European colonies near at hand, to be killed for the market. The total number of domestic bullocks in Siam is about one million and a half.

The Buffalo.—The buffalo is also met with in Siam in the

wild state, in a variety called *kathing*, with well-developed horns shaped like sickles. It is to be found in the same region as the above-mentioned wild bullock, and if attacked it is the most terrible animal to hunt.

The domestic one is the water buffalo (*Bos bubalus*), also boasting of horns of considerable width, about 2·50 metres, measured along their outer curve from tip to tip. It may easily be conceived from this what should be done when strolling unarmed and quite unconcerned through some paddy-field or grassy plain, where a herd of such domestic pachyderms is feeding or bathing in the pools; if suddenly frightened by the presence of a being so new to them as the white man, they are seen to start and charge down towards him. To repeatedly open and shut before them the umbrella which the European generally carries with him when he has not his gun is the most advisable solution of that sharp-horned dilemma. Surprised and frightened by the unusual manœuvre the panting animals stop suddenly, staring in their dull manner for an instant, just long enough for one to skedaddle into a place of safety or to climb a tree. If instead one is armed with a gun, a shot in the air produces the same providential result of momentary stupefaction in the herd, enabling one to effect a hairbreadth escape.

The surprising velocity in the charge of animals so stout and awkward is a revelation to him who is a spectator, or who for the first time is the involuntary object of their attack; it is no less surprising in the case of elephants. The domestic Siamese buffalo is, in fact, even larger than those in Southern Italy.

The number of domestic buffaloes in Siam is about equal to that of the bullocks; it is about one million and a half.

On account of their strength these pachyderms are indispensable in ploughing fields, and are also much used as draught animals. Their horns and skins form an important article of exportation, as may be seen from the following statistics referring to last year:—

	Francs.
Value of buffalo horns exported in 1910 . .	290,000
Value of buffalo and ox hides exported in 1910 .	2,466,000

Carts.—In the statistics drawn up so far as to the number of carts and wagons existing in Siam, distinction has not been made between vehicles drawn by bullocks and those drawn by buffaloes: their total, taken together, is about 170,000. Besides these there are wagons drawn by elephants, and horse-carts for transport, but in small numbers.

CLASS 40

Railway and Tramway Lines

Retrospective Notes

Although the immense advantage which would accrue to the development of the country from the construction of railroads was fully understood by the Siamese even from the beginning of the past reign, and preliminary studies were made to this end by the Government as early as 1884, different considerations, among which financial ones were not the least, hindered the realization of this noble design for some years. Finally, in March, 1891, the construction of the first line of 264 km., connecting the capital, Bāngkōk, with the principal town of the province of Khôrāt, was decided upon; and on March 9, 1892—a date which will remain memorable in the history of the industrial progress of Siam—King Chulālongkorn with great solemnity initiated the work by cutting the first turf of the new line. The first section of this was opened to traffic on March 25, 1897, and the last one on December 21, 1900.

In the meantime, however, the locomotive, harbinger of a new era, had already begun to make its auspicious whistle heard, flying bold and puffing on a short narrow-gauged line, which by concession of the Government to a local company had already been completed and opened to traffic since 1893.

After these first ventures, the good results of which inspired confidence for the future, the construction of State railways was vigorously pushed on, according to a scheme which, when completed, will link all the provinces with one another, and

with the capital Bāngkōk. At the same time private enterprises were multiplied for the construction of secondary lines with narrower gauges.

Statistics

At the present time the length of the railways in activity or in course of construction in Siam is as follows :—

I. *Lines in working activity*

	km.
State lines :	
(*a*) Ordinary gauge (1·435 m.)	774
(*b*) Narrow gauge (1 m.)	152
Private lines :	
(*a*) Narrow gauge (1 m.)	87
(*b*) Narrow gauge (0·75 m.)	19
Total	1,032

II. *Lines in course of construction*

State lines :	
(*a*) Ordinary gauge (1·435 m.)	19
(*b*) Narrow gauge (1 m.)	(about) 1200

Cost and Profit.—The total cost of the above-mentioned State railways, actually being worked, was about 115 million francs, which gave a net profit in 1910 of 4,620,000 francs, that is to say, more than 4 per cent on the capital invested.

The cost of the above-mentioned lines in course of construction is estimated to be about 120 million francs. The construction is being carried out under the direction of the Royal Railway Department of the Ministry of Public Works.

The present Exhibition gives, with a series of photographs, an idea of such works and of the route of State railways, whilst in the last official report published by the Railway Department itself (1910), which is also annexed to the Exhibition, technical men will find more detailed data concerning the actual organization, traffic, etc., of the railways above referred to.

[Since writing the above the Royal Southern Line, approaching the Malay Peninsula by way of P'hejburī, has been opened as far as Bān C'ha-ām on the west coast of the Gulf on June 11 of the present year (1911). In December it is hoped to open another section of 25 km., extending from that point to Húa Hin, a seaside resort further down the coast. As regards the northern line to the Western Lāu Country, this reached *Sālā Mè P'hũak*, as far as which point it was opened on June 1. Some delay occurred in completing this section owing to the intervening range of hills—called *Kháu P'hlŏng* (Fire Mountains)—having to be pierced by a tunnel. This, the first tunnel of any importance in the country, is 329 metres long and took nearly three years to complete (April 17, 1908, to April 3, 1911). Its cost was nearly 1,600 francs per lineal metre, or 526,000 francs in the total. Thanks to it the Lāu district of P'hrë, which offers so large possibilities to trade, may now be reached in two days from Bāngkŏk, whereas formerly it took from twenty to twenty-five days to get there.]

Tramway Lines

As the tramways of Siam are not shown in the Exhibition a few brief notes on them will be sufficient.

A first tram-line, with cars drawn by Siamese ponies, was constructed in 1888 at the capital Bāngkōk and opened towards the end of that year. In 1894 electric power was applied to it by means of aerial wires.

Afterwards it was extended and other lines were constructed in the capital, worked by two limited companies, of which one is European and the other Siamese.

The total length of these lines is now more than 30 km.

Omnibuses, etc.

Up to the year 1864 the river and the canals were the only commercial ways of communication within the capital, and boats the only means of travelling. Beyond these there only existed narrow lanes, which were accessible to no one but pedestrians.

It was towards the beginning of that year that King Mongkuṭ, in his earnest desire to renovate and improve the capital, had opened up a wide carriage road 6 kilometres in length, connecting the city proper with its outlying suburbs, situated lower downstream. Thus came into existence and was opened with much ceremony on March 17, 1864, what has been known to Europeans till this very day as the 'New Road', although in the meantime a good many other 'new roads' have been made in the capital which collectively extend to-day for 150 km.

It was on this first new road that private carriages began to run, and on June 9, 1881, a public omnibus service was established; later on (1896) there came the ubiquitous jinrickshas, drawn by Chinese coolies, and lastly motor-cars (1898).

To-day, as in our towns, hundreds of horse and motor omnibuses ply to and fro through the principal streets of Bāngkōk, to supplement the service of trams.

Carriages and motor-cars, both private and on hire, are moreover very numerous.

Part of Siamese panel.

GROUP VII

Transportation

Serial No.	Exhibitor.	Description of Exhibits.
	Class 38. Conveyances for ordinary Roads	
300	Nagara Rāja-Simā. Province of	Bullock-cart.
301	,, ,, ,,	,, covered.
	Class 40. Railways	
302	Royal Railway Department	Large frame of Photos showing railway lines and their working.
302*a*	,, ,, ,,	Thirteenth Report on the traffic on the same in 1910 (in print).

GROUP VIII

Navigation

CLASS 41

Oarcraft, etc.

Note on Siamese Boats

DWELLERS of a tropical region, endowed with a luxurious vegetation and largely of a deltaic description, where the rivers and canals formed the earliest thoroughfares of inland communication, and where they are still the easiest and most economical ways in the country, it is not surprising if the Siamese have attained in the building of small-sized craft and in river navigation a high degree of proficiency, so that they are second to none.

It happens, therefore, that, thanks to the familiarity they have acquired from their infancy with the liquid element, the foreigner who witnesses them sporting in it while bathing or ploughing the water with their multiform craft, which they man with such surprising dexterity, receives the impression that they feel more at ease and safer in water than on the mainland.

From the gorgeous royal barges, over 50 metres long, with high flaring bow and stern rising three or four metres above the water-level, enriched with elaborate carvings, glass mosaics, and gildings, which, propelled by long gilt paddles wielded by eighty men working in uniform cadence, may be seen stately filing past on the occasion of great religious ceremonies, almost as if they were the conscious rulers of waters, down to the lowest underling in the boat hierarchy, the Liliputian dug-out, so small that a child can hardly find sitting room in it, the fundamental

principle of construction is always the same. All these craft descend from one common parent stock, which is the log (generally of the *Hopea* tree, the *takhīen* of the Siamese, hauled from the far-away forest). Once hewn, it is hollowed out between the two ends by means of a primitive narrow-bladed axe, soaked for some time in water, and then turned bottom upwards over a slow fire of chips in order to make its edges expand, until in the middle it is nearly flat and one metre or more in breadth. The original log, once wrought into this form, constitutes the rudiment of any boat, if not, in certain cases, the totality of the boat itself.

Sometimes, in fact, and not unfrequently, the building process stops at this primordial stage, and in that case we have the dug-out canoe, made of a single piece of wood, in its simplest expression, such as may be seen in any waterway of the country, employed for multifarious purposes, even of some importance. Such are, for instance, the long, nimble, shallow, and narrow-beamed pirogues, called *rüa c'halā*, used for conveying paddy from its original fields.

But even in the more highly evolved craft, whether for cargo or for pleasure, there is no keel, so whether they be propelled by oars or by sail, in shallows or deeps, they slide on the water or on the mud rolling and lurching, but self-reliant and without ever getting stuck. As to capsizing, it seldom occurs, even to the tiniest craft, as the skilful boatman, either by varying his position or by the skilful handling of the oar or of the paddle, invariably succeeds in keeping his frail canoe balanced.

When from the rudimentary hull described above it is intended to evolve a more capacious and elaborate one, ribs and knees are fastened therein with hard wood pegs, slightly conical in shape, the smaller end of which is split and made immovable by the insertion of a wedge in the cleft. The ribs are made of a very hard and tough wood, *mai dëng*, or red-wood (*Xylia dolabriformis*), being preferred. Planks are then pinned to the ribs already placed, extending up to the gunwale or as high as the deck of the finished boat. Two blocks of wood are now fitted in the same manner, one for the bow and the other for the stern, to which the ends of the planks are firmly fastened.

By a similar method there are also fixed, if necessary, the deck, the superstructure, and the mast, generally single; mortises are sunk into the gunwale wherein to fix the pegs, or stoutlies, which are to serve as supports for the oars and rudder. These are lashed thereon by means of grommets of either twisted *pō* fibre or of rattan. Thus, without a single piece of metal in its structure and with the sole employment of wood, wrought with rude tools, the native boat springs out perfect and strong from the Siamese brain, as did Minerva from Jupiter's head.

Not less simple and ingenious is the rigging: some coils of rope made from coarse palm fibre, a single-fluked anchor of very hard wood (generally the *mai khléng*, botanically *Dialium ovoideum*), and sails consisting of matting or screw-pine leaves stitched together with ties of vegetable fibre are all that is required; while in canoes unprovided with either sails or mast a stalk of the *chāk* palm (*Nipa fructicans*) is sometimes hoisted to do duty as a provisional sail, when the wind is favourable and suggests the employment of it.

If one notices with surprise the total absence of the Latin sail, of which no trace is found in local traditions, the square lug being used instead, no less wonder is felt on the other hand in seeing that the Siamese, when not using the paddle, are rowing standing, in true Venetian gondolier style. This is but one of the many haphazard coincidences of the *nihil sub sole novum* order, which strike foreigners as soon as they reach Bāngkōk, between this 'Venice of the Far East' and the old Queen of the Western Seas. Sitting while rowing is scarcely practised, except in some Lāu boats and when rowing, after the European style, boats belonging to the Royal Navy, or to merchant ships, rigged in our manner.

The Siamese of both sexes display great powers of endurance when rowing with their oars: leaning upon these with the whole weight of their body, in order to obtain the maximum lever power when they are plunged into the water, they seem to show no fatigue and in fact to ignore it altogether. In long journeys by water it is quite common to see them rowing vigorously the whole day and a good part of the night, resting only during meals and allowing themselves but a few hours of sleep. No

less untiring and skilled are they in the handling of poles wherewith to punt their boats either in shallows or through the rapids, against which rowing is of no use. Where even poling is unequal to the task, lo! they jump into the water, with the end of the tow rope in one hand, and reaching the river bank they drag the boat; or else, if the steep or thickly wooded bank prevents this operation, they push the boat forward by muscular exertion, wading through the water.

In all these kinds of work, as well as in the arduous task of steering, they are indeed unrivalled. One must see them steer the slender barges shooting, swift as arrows, downstream, through the gurgling cataracts, threading in tortuous and giddy race among the rocks and cliffs, against which the imposing liquid mass is breaking with dreadful noise and fury! All this is nevertheless done by these frail skiffs, as powerless as straws in the face of such enormous mustering of natural energies, and they scarcely ever strike the rocks or get capsized in the whirlpools or sink in the open abyss, inhabited, according to local legendary lore, by mermaids, who never yield up their human prey. One must see them, I say, and admire them, in order to believe what otherwise might be deemed impossible. It is, however, a fact, nay, a prodigy which has long filled every traveller with wonder, because, more than a gallant performance worth witnessing, it is a life episode worth experiencing, not only by those who are in quest of ever novel and strong emotions, but also by anyone taking interest in the manifestations of human tenacity and pluck in its continual struggle against destiny and the forces of nature.

It would take too long to mention here, even in a cursory manner, the numerous types of craft invented by the Siamese, whether from necessity or for pleasure. The principal ones, which answer better to industrial or commercial purposes, are, moreover, represented in this Show. It will suffice, therefore, to draw attention merely to those few types which offer greater interest, whether from their wide employment or from the ingenuity of their construction, which latter, having due regard to the peculiar local conditions, may be said to reach in some instances ideal perfection.

The unsinkable boat employed on the Upper Më Nam and its principal tributaries, as well as on the Upper Më Khōng, has already been alluded to (see p. 43). Here, in short, are its salient characteristics. Ample and rounded in her keelless hull, and even towards the ends broad of beam, and of light draught, it nimbly answers to the rudder even in a swift current. Along the deck, on either side runs an outrigged gangway, on which the boatmen walk from bow to stern when using poles to punt the boat forward. About ten metres in length, this has two, or little more, of beam. On the stern deck there is a wide cabin, which might be more comfortable but for the long and large-bladed steering paddle forming the rudder, here manned by one or two men standing, and who are always present in the cabin, during navigation. As regards the crew, they are roomed in the bow, while the cargo and luggage are stored in the middle deck. On the bow are fixed two or more pairs of oars, and when possible the boatmen make use of the same, sitting with their back towards the bow and their face towards the stern. When going downstream bundles of bamboos are lashed to the gunwales on both sides of the boat, so that when she is shooting the rapids they, by their buoyancy, prevent her from capsizing or sinking. By this simple but admirable contrivance insubmergibility has been achieved in such boats, which among us has remained, till a recent date, an unattainable ideal.

No less perfect than the foregoing is the boat, either for river or sea navigation, by rowing or sailing, called *rüa pet*, 'duck boat,' owing to her easy lines allowing her to slip agile and swift on the water, with the same facility as the wild duck, of whose graceful motion she puts one in mind. For these qualities she is highly appreciated and preferred for travels along the coast. The size of her hold and her swiftness render her suitable for cargo. The maximum dimensions given her are about 15 or 16 metres in length, 4 in width, and $1\frac{1}{2}$ in depth.

Finally, worthy of mention, both for her good sailing qualities as well as for her extensive use, is the *c'halōm*, which is the favourite fishing and cargo boat, whether for deep-sea fishing

or for marine navigation. There are some of one hundred and even more tons carrying capacity. Once they have taken their moorings into the rivers they are usually converted into floating shops. In the hold there is the godown, and on the deck the shop, where the most various articles are retailed. During the long stays which they make for the purpose, the family—of which there is at least one, and very prolific to boot, dwelling in each of them—makes itself comfortable by transforming with roofings and partitions of mats and *kajangs* (a kind of mat of screw-pine leaves roughly stitched together) every bit of the space still left on deck. The space astern is reserved for the kitchen, represented by a terra-cotta portable stove. Close by is a roofed space doing duty both as parlour and dining-room during the daytime, but which becomes a cool dormitory at night. Here sits the mother of the family during the intervals of leisure, while close by her children play, read aloud some school-book, or sleep, as the case may be. Round-about may be noticed—unexpected sign of refinement—a few flower-pots consisting of some broken chattel or old kerosene tin, utilized for rearing pot-herbs and ornamental plants with fancy spotted leaves. Here in a corner swings, lulled by the breeze, the inevitable bird-cage, and in another slumber or snarl at each other (implacable foes) the pet dog and the domestic pussy, the latter sometimes a fine bob-tailed one, a peculiar characteristic of Siamese cats. Not unfrequently also under a big cage one may see, haughtily strutting about, a broad-breasted fighting cock, and so on, so that it may be said one has here before him on a small scale a reproduction, more or less accurate, of Noah's ark. Far from being tossed about by the waves, the boat is quietly moored by the bank of a river or canal, and lulled, though not always gently, by the wavelets raised by the steam launches or motor-boats which rapidly and continually pass up and down.

Such are the *e'halōm* boats which one may behold in long rows, whether gravely and slowly filing past, or placidly moored by the banks of the numberless rivers or canals of Siam, especially within the precincts of the capital, where, during the height of the trading season, these boats form the floating

dwellings for a hundred thousand and more people of either sex and all ages.

To give an idea of the important part played by native craft in Siam as means of travelling and transport, it will be sufficient to state that their collective number exceeds 450,000.

Notes on the Introduction and Development of Modern Shipping in Siam

As the traditional Siamese boats only are represented at this Show, the following brief notes in chronological order will serve to give an idea as to the development which the modern methods of naval construction have attained in Siam.

1835. October. The brig *Ariel*, the first square-rigged vessel ever built or exclusively owned by Siamese, was completed at Chanthabūn and presented to the King in Bāngkōk by Khún Sit, who later on became Prime Minister and Regent (1868-72).

The *Conqueror* followed next year (1836).

1844. January 11. The British steamer *Express* sailed up river to the capital, Bāngkōk, astonishing the natives on account of her whistle and her novel system of mechanical propulsion. It was the first steamboat that ever appeared on the Më Nam.

1855. November 9. The first steamboat ever built in Siam was completed under the supervision of P'hra Nāi Wai (son of the Prime Minister and, later on, Minister of War and Navy) and put into successful operation. It was a yacht for the King.

1860. The first steam man-of-war, the *Ajavatī*, was built by order of the first brother of King P'hra Pīn Klàu. She was already provided with a screw propeller.

1861. March 16. The first Siamese mail steamer, the *Chāu P'hyā*, of 310 tons register (built in England in 1858), starts running regularly between Bāngkōk and Singapore.

1862. July 21. The second Siamese mail steamer, the *Viscount Canning* (built in England in 1857), begins her periodical trips between Bāngkōk and Hong-Kong.

1888. May 14. The first steam ferry service for carrying mails and passengers up country is inaugurated.

CLASS 46

Inland Navigation : Works relating to Waterways

Though favoured by nature with numberless waterways, both for inland and sea communication, Siam early felt the necessity of opening artificial canals, both for trading and irrigation purposes. The old chronicles have only in a few cases mentioned the execution of such works, but the more modern ones permit us to form an adequate idea of the great development acquired by the same during the last century, especially so far as those undertaken by the State are concerned. Besides these, numerous are also those due to private initiative, to which the official chronicles seldom refer.

The first artificial canal recorded is Khlōng Töi, still in existence and situated to the south-east of Bāngkōk, which was dug by order of a king of Ayuddhyā in 1250 A.D. or thereabouts. Then follows that of Bāng Takhīen, having its outlet on the right bank of the river, immediately below that ancient capital, which it connects with Sup'haṇ, further to the west. It was completed about 1296.

In 1498 the deepening and cleaning of two very ancient canals is recorded. But the opening of a new one, that of Bāngkōk Yãi, in 1534, and of its branch, linking between them the ends of a big bend of the river, about 1562, marks an important date both for the civil history and local inland navigation. For this canal — to defend the lower mouth of which the citadel of Bāngkōk was built, thus creating the first nucleus of the actual capital of Siam—gradually widened, thanks to the corrosive action of the stream and tides, till it could receive the whole mass of the river, and this, forsaking its ancient meandering bed, began to flow through it, continuing to do so ever since. It was on the banks of this new bed of the river that the present city of Bāngkōk was built.

It would be too long to enumerate, even summarily, the artificial canals which have been dug from that period till this day. Their total length amounts to several thousand kilometres, while by tens of thousands of square kilometres must

be reckoned the area of unproductive land which thanks to such works was made capable of irrigation and withal of cultivation.

But the era of irrigation and canalization on a gigantic scale, and in accordance with the dictates of modern science, was initiated in Siam in 1903, by the foundation of an Irrigation Department, under the guidance of a distinguished engineer of wide experience. A vast scheme was then drawn up for the irrigation and drainage of the lower basin of the Më Nam, which means an area of over 20,000 square kilometres, by means of works of considerable importance: movable dams, tidal gates, navigation locks, etc. Though the Department has only been started a few years, it has already accomplished a remarkable amount of work: a number of old canals have been deepened and widened, dams, navigation and tidal locks built, and other important works of canalization accomplished. Photographic views of some of these are presented at this Exhibition.

There is accordingly every reason to expect in the near future a large increase in the agricultural production, the inland navigation, and the trade of Siam.

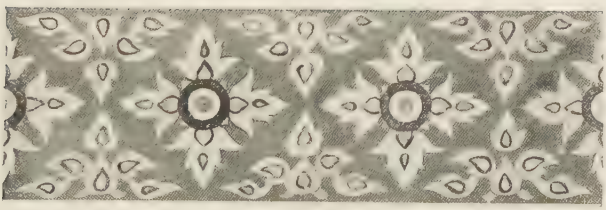
G. E. Gerini.

GROUP VIII

Navigation

Serial No.	Exhibitor.	Description of Exhibits.
	Class 41. Vessels	
303	Nakhōn Sawan, Province of	Model boat (*Rüa P'hĕ̃n Mā*).
304	,, ,,	,, (*Rüa Mū̃*).
305	,, ,,	,, (*Rüa Māt*).
306	NagaraŚrī-Dharmarāj, Province of	,,
307	,, ,,	,,
	Class 46. Inland Navigation (Photos of water gates and ways)	
308	The Royal Irrigation Department	Tidal sluice, Bāng Hīa (under construction).
309	,, ,,	Idem.
310	,, ,,	Navigation lock, Bāng Hīa. On the background, tidal sluice (see Nos. 308-9).
311	,, ,,	Navigation lock, P'hra Khanông (in Khlōng Prawēt, near Mënam Chàu P'hiyā).
312	,, ,,	Same lock, showing tide pit and inner lockhead.
313	,, ,,	Navigation lock, P'hasī-charön (near Khlōng Bāng Lúang), in operation.

Serial No.	Exhibitor.	Description of Exhibits.
314	The Royal Irrigation Department	Navigation lock, Bāng Hīa. On background, old Khlōng Bāng Hīa.
315	.. ..	One of the big floating dredges employed by the Department, having a capacity of 75 cubic metres per hour.



Part of Siamese panel.

The *hañsa* bird (a mythical swan, the vehicle of Brahmā).

GROUP X

Postal Service

Historical Note

THOUGH a rudimentary Postal and Telegraphic Service of a semi-official character had been at work for the interior of Siam long before 1881, the former with its own stamps, which have now become exceedingly rare, a public and proper Postal Service was not organized till that year, with the institution of a Post and Telegraph Department, under the auspices of Prince Bhāṇurangṣī, uncle of the present King, to whom is due the organization and the rapid development of that important branch. This, however, till July 1, 1885, the date at which Siam entered the Universal Postal Union, had its scope limited merely to the interior of the kingdom.

Until then the foreign correspondence was, by the courtesy of the British Consulate, forwarded to Singapore, and thence to its destination in both Hemispheres by the different mail lines. For this purpose a provisional Post Office had been established at the British Consulate, whence the correspondence from abroad could be delivered, and the outward letters handed in for transmission, via Singapore, by stamping them with postmarks of the Straits Settlements, under which jurisdiction that Consulate was at the time placed. In order to denote the place of dispatch of such correspondence, the stamps bore printed in black a 'B' (initial of the name of Bāngkōk). They could be purchased in this form at a trifle more than cost price, the surcharge being devoted to defraying the cost of carrying the said

correspondence by merchant steamers to Singapore. This provisional arrangement naturally ceased when in 1885 the Siamese Government, having entered the U.P.U., reserved to itself the exclusive privilege of the conveyance of mails to any part of the world.

Meanwhile, as regards telegraphs—of which in 1881 only a short line of some 30 kilometres existed, connecting the capital with Pāk-nam at the mouth of the river—a survey was begun that year for two lines intended to link Siam on the west through Tavoy, and on the east through Saigon, to the telegraph system of the world.[1]

These two lines were completed the following year (1882), and later on a third one was established to Penang, running along the west coast of the Gulf of Siam, and thence across the Malay Peninsula. Once Siam was put into telegraphic communication with the rest of the world, it began to develop its own inland system, which to-day has reached a length of lines of over 5,400 kilometres.

As regards telephones, a line of these was already in operation at the beginning of 1882 between Bāngkōk and Bāng-pa-In for a distance of about 80 kilometres, as was evidenced at the National Exhibition opened on April 26 of that year in the capital to celebrate the centenary of the present dynasty. Since then a complete telephonic system has been organized in Bāngkōk and extended also to the neighbouring provinces.

Furthermore, during the last few years experiments of wireless telegraphy have been undertaken, and schemes are now under consideration for the establishment of a similar service.

[1] A scheme for a telegraph line intended to connect Bāngkōk with Singapore and India came very near realization as early as 1866. In fact, in the *Bangkok Calendar* for 1868 the following entry occurs (p. 118):

(1866) 'April 24th. The Siamese Government grant concessions and sign articles of agreement for the construction of an Electric Telegraph from Rangoon through Siamese Territory to Singapore with a branch coming to Bangkok.'

This evidences that Siam early realized the advantages of telegraphic connexion with the rest of the world. It must have been owing to some unexpected difficulties that she had to postpone the accomplishment of that design for nearly twenty years.

Statistical Notes

I. *Postal Service*

Number of Post Offices existing to-day, 103. Besides these almost all the railway stations act as postal agencies.

Number of letters and post cards forwarded and delivered in 1909—

(*a*) By inland Post . . .	2,043,491.
(*b*) By foreign Post . . .	1,221,684.

The annual number of letters and post cards per person is 0·47. (N.B. In 1901 it was 0·12 only.)

II. *Telegraphic Service*

Total length of line (1909) . . .	5,366 kil.
Number of Telegraph Offices (1910) .	61

III. *Telephonic Service*

Total length of line	596 kil.
Number of Telephone Offices . .	396

G. E. Gerini.

List of Exhibits

GROUP X

Postal Service

CLASS 54

Serial No.	Exhibitor.	Description of Exhibits.
317	The Royal Post and Telegraph Dept.	Frame of photos illustrating the Postal and Telegraphic Services.
317*a*	Col. G. E. Gerini	Collection of Siamese stamps.

GROUP XI

Sporting Industries

General Notes

THE sports peculiar to Siam, which from time immemorial have formed the delight of the people, are the following :—

Races

1. With mounted ponies, either single or paired (in the latter case the rider bestrides two ponies at the same time, harnessed close side by side).

2. With carts drawn by a pair of bullocks.

3. With bullocks and sometimes with buffaloes, yoked to wooden ploughs (these are, however, held by men, who keep them raised above the ground).

4. With elephants (excited for the purpose).

5. With both elephants and ponies (these animals being made to compete in speed).

Regattas

1. With oar-boats rowed in a standing position, somewhat after the Venetian style.

2. With paddle-boats, propelled by paddles worked at free arm length.

Fightings

1. Of elephants (mounted or not), formerly also between elephants and tigers.[1]

[1] One of such fights is recorded to have taken place at Lop'hburī (an ancient country residence of the Ayuddhyā kings) on November 28, 1673, to which Lanneau, the Bishop of Metellopolis, was invited by the sovereign of the time (King Nārāi).

La Loubère, ambassador of Louis XIV to the King of Siam, relates in his book that he witnessed a fight between two war elephants. These were retained by the hind-feet with cables which several natives held, and which besides this were fastened to capstans.

2. Of buffaloes (excited for the purpose).

3. Of cocks (provided for the purpose with iron spurs tied to the feet).

4. Of fish. These fights are performed in water-basins, with a tiny variety of fish (*Betta pugnax*) extremely game. Naturally brown in colour they turn fiery-red as soon as they find themselves confronted, and rush at one another with great rage.

5. Of crickets. The season for these fights is April and May. An empty bucket does duty for battlefield, or even a simple pit a few inches deep and as much wide, dug into the ground.

Fencing, and Gymnastic and Athletic Exercises

1. Fencing with sabres single- or double-handed, with single-sticks (which are larger and longer than those employed among us), with a sword and shield, with a pair of swords (in which the fencer wields a sword in each hand), with spear and shield, etc.

2. Boxing. A combination of boxing and *savate*, in which both the hands, protected by rope gloves or not, and the naked feet are used.

3. Swimming (in which Siamese of both sexes acquire from their infancy a high proficiency).

4. Foot-races of various kinds.

5. Race in pots afloat on water. In this exercise the player strides with each of his feet fixed within a big earthen pot, while he leans with his hands on a stock, the lower end of which is secured in a third pot. This is a peculiar and very difficult sport, in which Prince P'hra Pīn Klàu, the younger brother of King Mongkut, and one of the most accomplished all-round sportsmen that Siam ever produced, excelled in his days.

Games

1. Polo or *khlī*. A traditional royal and aristocratic sport in Siam, which for some thirty years has been almost entirely replaced by polo after the European style.

2. *Wàu* or paper-kite competitions. Generally held with two kinds of paper kites, viz., (1) the 'male' or *kulā*, of a pentagonal lobate shape, recalling the heraldic lily, which is

tailless, and (2) the *pāk-pàu* or 'female', of a rhomboidal shape, provided with a long, thin tail. Both are flown up to great heights and handled with incredible skill. The contest consists in trying to capture, hold, and even to bring down to the ground the opponent's kite. For such purpose the cord is usually partly coated with a paste of powdered glass, in order to cut in two the cord of one's antagonist after having crossed it, thereby causing its immediate downfall. The actual struggle takes place at several hundred metres up in the air and at a distance of a kilometre or more from the players. Young and old people alike devote themselves with enthusiasm to such competitions, which are attended by crowds of spectators, and large sums of money are often lost and won in betting on two contesting kites. Codified rules exist for this game, much in the same manner as for our aviation meetings. The most favourable season for kite-flying is during the months of March and April, when high winds prevail.

3. *Takhrō*, or Foot-shuttlecock. This is a kind of hollow football, made of plaited strips of rattan, which must be tossed by striking it either with the sole of the foot or with any other part of the body, except the hands. The game is played by four to eight men standing at intervals, so as to form a circle of some ten metres in diameter. One throws the ball up in the air with his hands, and as it falls another tosses it up again before it reaches the ground, by striking it either with his foot, his knee, his shoulder, or the crown of his head, sending it towards one of his companions, to be struck in his turn by the latter in a similar style. The tossing thus continues sometimes for a long while without the ball ever touching the ground. The skill of some consummate players in striking the ball, either in front or behind them and in the strangest postures of the person, is really wonderful. Some may be seen keeping on tossing it with their knee or head for quite a number of times in succession without letting it fall or getting out of reach.

To the above forms of sport peculiar to Siam, there have been added during the last thirty years some more imported from Europe, which attained a considerable development thanks to the foundation of numerous sporting clubs in the capital and

in other cities of the kingdom. Without entering into lengthy particulars, it will be sufficient to enumerate the principal sporting associations existing in Bāngkōk. They are the following :—

1. *Royal Bāngkōk Sport Club*, patronized by the Court, the largest and most important of all. Its principal aim is the improvement of the breed of the Siamese pony by the organization of various annual race meetings. It also promotes football and any other kind of athletic sports. It was inaugurated on July 1, 1901, with horse-races.
2. *Bāngkōk Cricket Club.*
3. *Lawn Tennis Club.*
4. *Golf Club.*
5. *Gun Club* (for day pigeon shooting).
6. *Krung Thēp Rifle Association* (for target shooting).
7. *Bāngkōk Riding Society* (for cross-countries, paper-chases, raids, etc.).
8. *Royal Motor-boat Club* (for motor-boat trips, regattas, etc.).
9. *Krung Thēp Sailing Club* (for sailings and regattas in the Gulf).

All, or almost all, of these clubs include the *élite* of Siamese society, either as patrons, or as honorary, committee, or ordinary members.

G. E. Gerini.

CLASS 59

The Turf, General Horse Management, Racing, etc.

Note re Siamese Ponies

1. *Origin*

Uncertain, but probably from Burma and South China.

2. *Characteristics*

Height.—An average of certainly not more than 11·3 hands. Very rarely a pony of over 12·1 is met with. (But larger ponies are found in the north, due to importation of Shan ponies.)

Colour.—Generally bay, but chestnuts, grays, and duns are met with, and more rarely blacks.

Build.—Well-bred ponies (e.g. first-class racing ponies) are handsome, well-set beasts, stand well, with good head and shoulders, can carry weight, and have a good turn of speed. (N.B. Top weight in handicaps at the Royal Bāngkōk Sport Club is 9 st. 4 lb.)

Disposition.—As a rule good-tempered, but if ill-treated become very vicious. Very highly strung nerves. It has been frequently noticed that a first-class pony in training shows all the peculiar habits of a thoroughbred race-horse.

Food.—Grass-feeders, principally meadow grass and paddy.

Use. -Generally used in the country for riding purposes.

3. *Breeding*

Chief Centres.—Lop'hburī, Āngthōng, Khôrāt; very little trouble taken in selection. All ponies turned loose, and promiscuous breeding the result except in very exceptional cases. A few private experiments have been made in cross-breeding with Walers and Arabs, but with indifferent success. Government has not yet established a stud farm, but is expected to do so in the near future.

In the chief breeding centres racing, in pair matches, is fairly common, but ponies of greatly varying heights are seldom raced together.

4. *Speed Records*

The following times have been made at the Royal Bāngkōk Sport Club (weights averaging over 8 stone) :—

	min.	sec.
½ mile	1	$2\frac{1}{5}$
5 furlongs . . .	1	19
6 „	1	$35\frac{1}{5}$
7 „	1	56
1 mile	2	14

W. G. Johnson.

N.B. Three Siamese ponies were sent by King Mongkuṭ to Napoleon III with the Siamese embassy of 1867. The Emperor presented them to the *Société Impériale d'Acclimatation*, of which he was a patron. These ponies came from the Lāu provinces, probably Khôrāt. (G. E. G.)

GROUP XI

Sporting Industries

CLASS 59

The Turf, Racing, etc.

Serial No.	Exhibitor.	Description of Exhibits.
318	The Royal Court	One frame, 'The Horse in Siam' (photos of Siamese racing and riding ponies).

GROUP XIII

Decoration, Furniture, and Appointments

CLASS 72

Cabinet Work and Furniture

THE enormous richness of Siam in so many kinds of building and fine timber was certainly the reason that woodwork and ornamental carving attained in that country, from the earliest times, a remarkable development, both in the fields of decoration and artistic furniture.

In the former such crafts chiefly applied themselves to architectural ornaments, to door and window frames and panels for temples and palaces, of which fine specimens still exist. The most famed among these are the doors, splendidly carved and sculptured, of the *P'hrah Thĕn* (the Buddha's Couch) Sanctuary at Thŭng-Yāng, and of Wat Suthat in Bāngkōk. These last were brought thither from the ancient capital, Sukhôthai. Such masterpieces date from the fourteenth or fifteenth centuries.

Later on the art of woodcarving was superseded, especially in so far as door and window panels were concerned, by the more modern crafts of mother-of-pearl inlaying and lacquer [1] and gold

[1] The term 'lacquer' is, indeed, inappropriate, but it is generally employed, for want of a better one, to designate the oleo-resin derived from the *Melanorrhœa usitatissima* or black varnish tree, called *rāk* in Siam. Most varied are the uses of this valuable substance, e.g. :—

(*a*) In a liquid state: as glossy varnish on woodwork; as coating on paper, textiles, and any wickerwork which it is intended to render waterproof; on statues, stucco, furniture, etc., as a preparation for gilding. It is also, if

painting. The greater development acquired by these during the more recent centuries is probably, nay almost certainly, due to the influence exerted by Chinese art, which finds its explanation in the increase since the fifteenth century of the commercial intercourse between Siam and China.

The oldest, largest, and most perfect specimen of mother-of-pearl inlaid work existing in Siam is undoubtedly the one adorning the doors of the *Buddha Jinarāj* Sanctuary at Biṣṇulôk, which, as is stated in an inscription engraved on them, were made by the King's order in 1755. Another masterpiece of the same kind, though more recent, are the doors of the two entrances to the Royal Temple (*Wat P'hraḥ Kèu*) situated within the precincts of the Royal Palace in Bāngkōk. They date from little more than half a century ago, but their finish and excellence of workmanship gain the admiration of all visitors.

As regards internal decoration and upholstery, the arts above referred to were applied to them in turn in the same order. Their almost exclusive fields have been, up to a recent date, the Royal Palace and the temples, the latter principally. It is in the shrines that one can admire the most perfect specimens of upholstery, whether carved, sculptured, or painted with lacquer and gold. Among the pieces of furniture that have always received special attention are the cases for the sacred books which are to be found in every monastery, either in the shrine or sanctuary proper, or in the cloister adjoining. Such

necessary, coloured with lamp-black, orpiment, indigo, vermilion, silver and gold leaves, and applied with a brush, either in the ordinary manner or, as in the case of round objects, while the same are revolving on the turning lathe.

(*b*) In a plastic state (to which it is brought by thickening it with ashes or sawdust): as putty for stopping fissures and filling up depressions in woodwork; as a plastic material for ornaments in bas-relief, and even to close the meshes of a basket, thus transforming the same into a perfectly water-tight bucket; and finally as cement for inlaid work and mosaics. The last-named are generally made with tiny bits of coloured glass embedded in the said cement, which, during the course of time, hardens and becomes very resistent to any temperature and inclemency of the weather.

To the above-mentioned valuable oleo-resin is due the rise and the prosperous development, in the countries which produce it, of the arts of mosaic, inlaying, and lacquering. For some specimens of the latter crafts, see Group XXI, Class 137. For samples of the oleo-resin, see Group XV, Class 80 (Nos. 357-8), and Group XVIII, Class 122.

bookcases are often real masterpieces, as well as the lofty glass case, tower-shaped, in which is kept burning the whole year round the sacred taper (a sort of Paschal candle) whence fire is taken to kindle the funeral pile on the occasion of cremations. The arm-chair reserved to the archdeacon and elder monks during the performance of rites or for expounding the sacred texts to the faithful, as well as the largest part of the paraphernalia of worship, naturally offer to local artists the opportunity of best displaying their talent and skill.

Very rare are the pieces of furniture in wrought iron, as this art is one of the least developed in Siam : a few specimens may be noticed in the temples, restricted generally to lampadaries in the old style, to tripods for gongs, and to racks with rows of sharp points on which the faithful fix their votive tapers.

More numerous are the artistic bronzes, which range from the implements of worship to statues of Buddha and his disciples. In this art, originally imported from India, and kept flourishing for centuries, the Siamese have produced real masterpieces, even of large size, which would take too long to enumerate. Let it suffice to mention the marvellous statue of the *Buddha Jinarāj* at Bisṇulók, dating from the twelfth century A.D., of which a picture is presented in this Catalogue (p. 82 *infra*).

In the present brief review must also be included ivory carving, of which magnificent specimens may be admired, either in the temples (arm-chairs, caskets, sacred implements) or in kingly and princely palaces (sword-hilts and scabbards, musical instruments, elephant howdahs, etc.). In these stately buildings woodcarving, mother-of-pearl inlaid work, mosaics in coloured glass, and above all lacquer-and-gold paintings find extensive employment not only in almeirahs, sideboards, dressing tables, mirror frames, etc., but also in other pieces of domestic furniture.

The decorative style here follows on the whole that of temples in the basements, pillars, capitals, brackets, pediments, and finials. Predominant motives are the *nāga*, or mythic serpent, the lotus flower, the legendary bird *garuḍa*, the lion head (incarnation of Viṣṇu), and figures of giants (*kumbhandas*), of semi-human birds (*kinnaras*), of titans (*yakṣas*), and of celestial nymphs, whether in dancing gait or in graceful postures

(generally with joined hands as a mark of obeisance, or offering flowers or garlands).

It is in one word the Siamese style which prevails in all its multifarious and gorgeous manifestations in every field of the local art, not excluding ceramics, of which there also exist very interesting and splendid old specimens, survivals of an industry which from the eleventh to the eighteenth century has flourished in Sawankhalôk.

In the present Show there are only exhibited reproductions of ornamental motives in lacquer and gold, which adorn some of the finest door panels and bookcases of the Siamese temples: a specimen of ornamentation on a gong is also presented. Though few in number, these exhibits should give a fair idea of local decorative art.

G. E. Gerini.

GROUP XIII
House Decoration

CLASS 72
Upholstery and Furniture

Serial No.	Exhibitor.	Description of Exhibits.
319	Ministry of Interior	Panel of a Bookcase, National Library.
320	.. ..	Part of panel of a Bookcase, Wat Thēpsirindr.
321	.. ..	Part of panel of a Bookcase, Wat Sunklīeng.
322	.. ..	Part of panel of a Bookcase, Hō Monthiēr-Tham.
323	.. ..	Door-fillings, Wat Beñchama-bop'hitr.
324	.. ..	Part of Door panel, Phrah Rabīeng of Wat Chĕng (Aruṇ).
325	.. ..	Part of panel of Central Door. Bôth Wat Thōng.
326	.. ..	Ornament from basement of pilasters, Wat Beñchama-bop'hitr.
327	.. ..	Ornament of a door, Bāngkōk.
328	.. ..	Ornamentation on a gong (private property).
329	.. ..	Door of a Bookcase, National Library.

Famous statue of the *Jinarāj* Buddha at Bisnulók (twelfth century), see p. 79. Height, 3'67 metres; lap-width (from knee to knee), 2'90 metres.

GROUP XIV

Theatre, etc.

CLASS 77

Theatre Material

Notes on the Siamese Theatre

THERE are, at the present time, many forms of entertainments in Siam. Barring such as have frankly been adopted from Europe in recent years, there still remain many others which may be considered indigenous, and may be classified as follows :—

1. The *khôn* or masked drama.
2. The *lagor* (commonly written *lakhōn*) or ordinary drama.
3. The *likē*.
4. The *hún* or marionettes.
5. The *náng* or transparencies.

These, with the exception of the *likē*, are the genuine ancient forms of Siamese entertainment. Of these by far the most interesting and most worthy of consideration are the *khôn* and the *lagor*, which will therefore be a little more fully treated later on. The rest may be dismissed in a few words.

Likē.—The *likē* is the form of entertainment now most regularly presented. Its origin is curious. It was at first merely a form of religious worship, indulged in by a certain section of Muḥammadan Malays, and in no way resembled the form which is to be seen at the present day. In the original *likē* devotees or dervishes were seated in a ring, and chanted certain

prayers or hymns to the accompaniment of tom-toms or large tambourine-like drums called *ramanā*. Occasionally there were solos. Later, the irreverent amongst the Malays improved upon the original *likē* by interlarding jokes into the solos. The Siamese, seeing the humorous side of the affair, began to imitate the *likē* performance. This was how the *likē* obtained its footing as a form of secular entertainment. It went on developing, losing more and more of its original character, until it finally reached its present form, which is nothing more than a sort of parody of the more dignified and graceful *lagor*. The performers in the *likē*, as now played, are for the most part clowns who sing and dance in a very indifferent manner; but as they generally contrive to be funny, in a sort of rough fashion, they are popular with a certain class of people who are not very discriminating in their taste.

Hûn.—The *hûn* (literally 'model'), or 'marionettes', is very seldom seen nowadays, and in point of fact even when it is presented it seldom draws a good audience. Everything points to its being painfully out of date. The figures, however, are often genuine works of art, being carefully made, and correctly dressed in almost every detail. They are manipulated by means of a number of threads, concealed within the figures, and are pulled from below, not from above, as is the case with European marionettes. They are by no means easy to manipulate, and practically the only people who can do so are those belonging to the royal troupe. The plays represented are mostly classical dramas, which, if anything, further tends towards the *hûn's* want of favour among present-day audiences. There is, however, a more popular form of *hûn*, known as *hûn krabawk* (literally 'cylindrical model'), which is a sort of Punch and Judy show, the figures being manipulated in the same manner as Punch and Judy figures. The plays represented by the *hûn krabawk* are usually of the lighter kind, and are therefore rather more popular than the legitimate *hûn*.

Nâng.—The *nâng* (literally 'skin' or 'hide'), or transparencies, is a form of entertainment which still finds favour amongst a large section of the public, and such ows are often

seen at the more important cremations. The transparencies are frequently real works of art. Figures are beautifully drawn and embossed upon pieces of skin and beautifully painted, so that they form perfect decorative pictures. They are each mounted on two sticks by which the transparent picture could be held up. A large screen of white sheet is fixed up with lights behind, and the transparencies are displayed against the screen, either from within or without. These pictures represent various characters in drama, principally figures in the *Rāmāyaṇa*. The words of the drama played are recited by a chorus, the transparencies being moved about in accordance with the words by men who are generally accomplished dancers, as they are required to dance while they move the pictures.

The *nàng* is certainly not a very exciting form of entertainment, but it is one to be enjoyed by those who do not mind taking their pleasures in a placid manner. There is, however, another kind of *nàng* known as the *nàng talung* (from the fact that they were originally played by the natives of Badalung or Talung). The figures of the *nàng talung* are smaller, and some are so constructed as to have one of the arms movable. They are on about the same level as the *hùn krabawk*, and are about as popular. All kinds of light drama are presented by the *nàng talung*, the manipulators of which generally are themselves singers and comics, who often raise roars of laughter.

The Drama

Having disposed of the miscellaneous entertainment, we may now come to the Drama proper. The Siamese theatre may be classified under two distinct typical heads, namely, the *khôn* and the *lagor*. These two types, though differing from one another, have many things in common, and these may be mentioned first.

The *Theatre* where the *khôn* and *lagor* are performed is anything but an elaborate building. It possesses the beautiful simplicity of an ancient Greek theatre, only more simple still. Neither stage nor scenery is required, and very little stage

furniture is used. The chief requirement is a clear space where the dances and actions can be performed adequately. A wide bench is provided at either end of the clear space to form a throne for the chief personages. When the scene is supposed to be a garden trees are placed at regular intervals about the arena, or when it is a bedroom scene a screen is placed somewhere as a conventional sign thereof, and so on.

Costumes and *properties*, however, are very elaborate, and are made as accurately as possible. The costumes are made to resemble those worn in Siam in the olden times, and have not changed during successive generations, because they have been found most picturesque and suitable. The costume for a royal personage consists of a pair of embroidered breeches, a loin cloth worn outside the breeches held in place by a broad sash, over which again is worn a jewelled belt; a tight-fitting jacket embroidered with gold, with large embroidered epaulettes, and a jewelled collar. Certain ornaments are worn across the breast, and bracelets, armlets, and rings are also worn; sometimes embroidered breast-pieces are donned to represent armour; a crown or coronet completes the costume. Other male personages are similarly, but less elaborately, arrayed. The costume for female characters consists of a cloth worn like a skirt, reaching down well below the knee, with an embroidered scarf draped over the shoulder. For ornaments there is a jewelled collar, a necklet, bracelets, armlets, anklets, and rings. Queens or royal personages wear crowns or coronets; others have various kinds of head-dresses suitable to their rank and station. There is no attempt at making up the face, which is only thickly powdered. Those who play what may be termed 'character-parts', such as demons, monkeys, or yogis, wear distinctive masks of different colours and designs. The treatment of these masks is purely conventional, no attempt being made to have them life-like; but each mask is a good example of Siamese decorative art, and is distinctive and characteristic, so that each character may at once be recognized by the mask worn by the actor. A fuller description of these masks will be found in the latter part of this paper. All properties such as weapons, chariots, and so on, are very elaborately made.

Animals, when they appear, are easily known by their masks. These animal masks are really very well made, and are sometimes quite true to nature. There is, however, scarcely any further attempt at naturalness beyond the masks, as the actors who play the rôles of animals simply wear a pair of loose trousers, and a jacket of a colour somewhere near the real colour of the animals they represent, but it need not necessarily be a very faithful copy.

Besides the above there are some miscellaneous characters which are costumed in a manner suitable to each. In these cases it is permitted to each individual actor to dress up his own part to a very great extent.

The *Music* is an important feature of the Siamese drama, but as it is a branch of study in itself it would be obviously impossible to do anything but just touch upon it slightly here. The music, like practically everything else connected with the Siamese theatre, is somewhat strictly bound by tradition. Although 'singing tunes' may be altered and arranged to suit each individual theatrical manager's taste up to a certain extent, those which we may call 'action tunes' are quite unalterable. Each 'action tune' is a conventional sign in itself, and is indissolubly connected with certain dances or actions. Thus, there is a 'walking tune', a 'marching tune', a 'laughing tune', a 'weeping tune', an 'anger tune', and so on. When the orchestra strikes up one of these tunes the actor knows at once what he is supposed to do, and dances or acts accordingly. Some of these tunes are really very expressive of the action they denote, but of course it is imperative that one should first have learnt to understand the character of Siamese music, when these tunes will be duly appreciated at their true value.

Songs are not, as a rule, sung by the actors themselves, as it is practically impossible to sing and execute the accompanying elaborate dances and posturing required at the same time. Experiments have of late years been often tried, but they have not been attended with any considerable amount of success. Since this is so, it is more usual to have the songs sung by a troupe of singers, the actors merely dancing and posturing to illustrate the words sung. This plan, though it may seem

strange to foreigners, works extremely smoothly, and appears to the Siamese to be perfect.

This is not the place to give an elaborate description of Siamese musical instruments, but it may be noted that, for theatrical purposes, the orchestra is made up of the following instruments:—

1. *Ranād ēk*, or the alto xylophone.
2. *Ranād thum*, or the basso xylophone.
3. *Ghōng yãi*, or the large (basso) gongs.
4. *Ghōng lek*, or the small (alto) gongs.

These two latter instruments consist of circular frameworks, upon which are hung a set of gongs graduated to scale.

5. *Pī nai*, or the alto flageolet, a kind of harsh oboe.
6. *Pī nawk*, or the basso flageolet, a kind of harsh oboe.
7. *Tap'hôn*, a kind of tom-tom.
8. *Klōng thad*, a set of three drums.

The above are the most important component parts of the orchestra, but certain other minor instruments may be added if required.

Having now prepared the ground, so to speak, we may go on to mention the essential difference between the two forms of Siamese drama.

Khôn.—The *khôn* is a form of drama that is undoubtedly of ancient origin, wherein practically all the actors, except those playing female parts, wear distinctive masks. As a rule women do not play in the *khôn*, even the female parts being taken by men. The dancing and posturing are both graceful and expressive, grace and expression being very nicely combined. Not only the arms and hands but the whole body has to be used, and it is no exaggeration to say that a great deal of muscular exertion is required to perform the dances and postures in the proper way. The training of a *khôn* actor is both long and tedious. In the first stages it resembles a very thorough gymnastic training. It takes the best part of a year, sometimes longer, before an actor attains anything like proficiency.

Taking the fact of the strenuousness of the dancing and posturing into consideration, it is obviously impossible for the actor to sing or speak his own lines; besides, even if he were

not too tired to do so, the mask he wears would effectually prevent him from being heard clearly. Therefore, his lines are spoken for him by a chorus, the actor suiting his actions to the words. There are also certain occasions when the actor relies upon pantomime to express his words, and such pantomimic action could be as expressive as words when performed by a first-rate actor.

The plays presented by the *khôn* are always some portions of that great Indian epic, the *Rāmāyaṇa*, the whole of which has been done into Siamese.

Lagor.—The *lagor* (or more commonly, but quite erroneously, *lakhōn*) is also a very ancient form of drama. In this the players do not wear masks unless they represent the parts of demons, monkeys, or some being other than human. Both men and women take part in *lagor* performances, but they do not play together as a general rule. Indeed, in what may be termed genuine *lagor*, all characters, male and female, are played by women, with the exception of clowns, who are men. As is to be expected, grace rather than strenuousness characterizes the dances and posturings of a *lagor* player, and the arms and the hands play more prominent parts than the lower limbs. In training a *lagor* player more attention is paid to training the body to move gracefully than to muscular exertion. As the strong point of the *khôn* is its strenuous virility, so is grace of action the strong point of the *lagor*.

The *lagor* may be termed a singing drama, but this does not mean that the players themselves sing. A choir sings; the players act and dance to suit the words. The players may, however, speak certain lines for themselves.

Besides the serious *lagor*, there is also the *lagor talok* or Comic Drama, in which men and women play together, and nearly all sing their own solos, aided by the choir. This is an excellent form of entertainment, and provides a good deal of fun; but unfortunately it has almost practically been ousted by the more vulgar *likē*, which is much easier to act, and requires practically no previous training.

There are also two other primitive forms of *lagor*, known as the *lagor c'hātrī* and the *manôrā*. Of these, the *manôrā* is

the more primitive, and therefore, probably, the more ancient form; it is still extensively performed in the southern provinces of Siam. The *c'hātrī* is said to be also of southern origin, in which case it is probably an improved form of *manôrā*, although the writer prefers the more simple and primitive *manôrā* to the *c'hātrī*. The very primitiveness of the *manôrā* is its chief attraction. Everything in it is so unaffectedly simple and unostentatious, but it cannot be denied that, like plain food, it does not please every one equally.

The plays presented by the *lagor* are many and various, since tradition does not bind it to the representation of the *Rāmāyaṇa* alone as in the case of the *khôn*. Siamese dramatic literature is not extensive, so that practically no new pieces are ever seen. Virtually all the best pieces have attained the rank of classics. Stories from Indian mythology and epics provide the sources of drama, although there are some genuine and original Siamese tales of great merit and popularity, notably the *Khun C'hāng Khun P'hën* and the *Krāi Thōng*, which are both tales of the latter period in the history of Ayuthia.

Having given a brief outline of the condition of the genuine Siamese Drama, we now proceed to give a list of the principal characters appearing in the *Rāmāyaṇa*, which list will at the same time serve as a sort of catalogue of the collection of theatrical masks presented here in the Pavilion of the Kingdom of Siam at this Exhibition.

List of Characters in the Rāmāyaṇa[1]

N.B. Proper names within parentheses represent the Sanskrit form of such as are given in black type, whenever the latter in their Siamese spelling differ from the original Sanskrit ones. A short description of the mask worn, etc., is added at the end of each respective entry.

I. Celestials

1. **Śiva,** the chief of the gods; white, crowned.
2. **Umā Bhagavatī,** wife of Śiva; proper, crowned.
3. **Mahēśvarī,** id.; id.
4. **Sarasvatī,** id.; id.
5. **Khanda Kumāra** (*Skanda*), son of Śiva; golden; six faces, twelve hands.
6. **Vighaṇēś** (*Gaṇēśa*), id.; dark brown, elephant-headed.
7. **Vināya** (*Vināyaka*), id.; id.
8. **Chitu-pāda,** minister to Śiva; dark red, uncrowned.
9. Id., id.; id.
10. **Chitu-rāja** (*Chitra-ratha*), id.; golden, uncrowned.
11. **Chitu-sēn** (*Chitra-sēna*), id.; light red, uncrowned.
12. **Viṣṇu** or **Nārāyaṇa,** one of the gods of the Hindu Trilogy; deep azure, crowned; four arms, hands holding a conch trumpet, a wheel, a short trident, a club.
13. **Śiri** (*Śrī*), wife of Viṣṇu; proper, crowned.
14. **Lakṣmī,** id.; id.
15. **Brahma** (*Brahmā*), one of the gods of the Hindu Trilogy; white; four faces, eight arms.
16. **Indra,** regent of the Firmament; green, crowned.
17. **Suchitrā,** wife of Indra; proper, crowned.
18. **Sujātā,** id.; id.
19. **Sudharmā,** id.; id.
20. **Sunandā,** id.; id.
21. **Arajun** (*Arjuna*), celestial warrior; golden (or proper), crowned.

[1 Siamese version, or rather adaptation of the poem, called *Rāmakīen* (*Rāma-kīrtti*), which, as may be seen from some of the footnotes appended to this list, considerably differs in some matters of detail from the two well-known Sanskrit recensions of the poem in India. It would be too long and rather out of place to discuss here the causes which gave rise to such discrepancies in the Siamese version. Suffice it to say that some of these are distinctly traceable to Buddhist influences. (G. E. G.)]

22. **Mātulī** (*Mātalī*), Indra's charioteer, lent to Rāma during the war; white, crowned.
23. **Vēsu-ñāṇa** (*Viśva-jñāṇa*), minister to Indra; yellow.
24. **Visu-karma** (*Viśvakarman*), celestial armourer; green, turbaned.
25. **Maṇī-Mēkhalā,** a sea-goddess (see also No. 229); azure (not masked, but painted).
26. **Āditya,** the sun; red.
27. **Chandra,** the moon-god; white.
28. **Angār** (*Angāraka*), or Mars; pink.
29. **Budh** (*Budha*), or Mercury, son of Śiva; green.
30. **Bṛihas** (*Bṛihaspati*), or the planet god Jupiter; yellow.
31. **Śukra,** or the planet god Venus; light yellow.
32. **Saura,** or the planet god Saturn; black.
33. **Rāhu,** the god of meteors and a personification of the eclipse and ascending node; purple.
34. **Kētu,** a malignant god and a personification of the descending node; golden.

N.B. The nine gods mentioned above, from Āditya to Kētu, form the 'Nava graha Devā' or 'Nine Gods of Destiny', so called because they are supposed to take turns in watching over the destiny of each and every man.

35. **Vāyu,** the god of Wind (Eolus); white.
36. **Agni,** the Fire-god; red.
37. **Kāla, Kālī** (or *Durgā*), a malignant deity (Time, Fate, Ill-luck);[1] dark sepia.
38. **Vanaspati,** god of the forests (Sylvanus); light yellow.
39. **Smudr** (*Samudra*), the ocean; sea-green.
40. **Hima-bānta** (*Himavat, Himavanta*), the god of the Himālayan forest and king of mountains; dark rose.
41. **Viruṇ** (*Varuṇa*), the rain and the sovereign of waters (a sort of Neptune); azure.
42. **Mahā Jaya,** god of Victory;[2] yellow.
43. **Virūḷ-haka,** the chief of the Kumbhaṇḍas and regent of the South; dark purple.

[1 *Kala* (Time, Fate, Death) is a form of Yama; *Kālī* (the Black) or *Karālī* (the Dreadful) is Durgā, the terrible form of Mahādevī, wife of the god Śiva; *Kālī* is the spirit of evil or ill-luck personified. (G. E. G.)

2 Perhaps identical with *Jaya* or *Jayanta*, the son of Indra. G. E. G.)]

44. **Virūḷ-pakṣa** (*Virūpākṣa*), chief of the Nāgas and regent of the West; light purple.

2. Mortals, descendants of the Gods

45. **Anōmātan** (= *Raghu*), king of Ayuddhyā or Ayodhyā, son of Viṣṇu; white (or proper), crowned.
46. **Maṇī-kēśara** (*Maṇi-kēśarā*?), queen to the above; proper, crowned.
47. **Ajapāl** (*Ajapāla* or *Aja*), king of Ayodhyā, son of Anōmātan (Raghu); white (or proper), crowned.
48. **Dēva-Apsara** (*Dēvī*?), queen to the above; proper, crowned.
49. **Daśaratha,** king of Ayodhyā, son of Ajapāl (Aja); white (or proper), crowned.
50. **Kansuriyā** (*Kauśalyā*), queen to Daśaratha; proper, crowned.
51. **Kaya-kēśī** (*Kaikēyī*), id. (this lady was the cause of Rāma being exiled from his kingdom); id.
52. **Smudā** (*Sumitrā*), queen to Daśaratha; id.
53. **Rāma,** king of Ayodhyā, son of Daśaratha and Kansuriyā (Kauśalyā), incarnation of the god Viṣṇu; green, crowned.
54. **Bharat** (*Bharata*), regent of Ayodhyā during Rāma's exile, son of Daśaratha and Kaya-kēśī (Kaikēyī); red, crowned.
55. **Lakṣaṇa** or **Lakṣman** (*Lakṣmaṇa*), son of Daśaratha and Smudā (Sumitrā), Rāma's comrade during his exile and his lieutenant in the war; golden, crowned.
56. **Satrud** (*Śatrughna*), id., companion to Bharat; light purple, crowned.
57. **Makuṭ** (*Kuśa*), son of Rāma and Sītā; green.
58. **Lava,** id.; id.
59. **Sumantan** (*Sumantra*), chief councillor to Daśaratha; proper, uncrowned.

3. Mortals, other than those of Heavenly descent

60. **Roma-bata** (*Romapāda*), king of Bada Visaya (Anga); white (or proper).
61. **Aruṇavatī** (*Śāntā*), daughter of Romabata (Romapāda); proper.

62. The king of **Kayakēs** (*Kaikēya*), father of Queen Kayakēśī (Kaikēyī);[1] white (proper).
63. **Kēśinī**, queen of Kayakēs (Kaikēya), mother of Kayakēśī (Kaikēyī); proper.
64. **Janaka Chakravatti** (*Chakravartī*), king of Mithilā (the capital of the Videha country), who adopted Sītā as his daughter; white (or proper).

4. Ṛiṣi (Hermits or Anchorites) mentioned in the Rāmāyaṇa

N.B. All Ṛiṣi masks, unless otherwise stated, are of the proper colour.

A. *The four who took part in the founding of Ayodhyā*

65. **Achanda-Gāvi.**
66. **Yuddha-Akkhara.**
67. **Daha** (*Dakṣa*?).
68. **Yāga** (*Yajna*?).

B. *The four who brought life to Mandodevī* (*Mandodarī, see No. 117*)

69. **Roma-Sinha.**
70. **Vatanta.**
71. **Vajira** (*Vajra*).
72. **Viśuddhasa.**

C. *The ṛiṣi who brought Kāl-Achnā* (*Ahalyā, see No. 246*) *to life*

73. **Gotama.**

D. *The five who brought about the incarnation of Viṣṇu, causing Rāma to be born*

74. **Palaya-Kota** (*Ṛiṣya-Śringa*); deer-faced.
75. **Svāmitra** (*Viśvāmitra*).
76. **Vaj-aggi.**
77. **Bharadvāja.**
78. **Vasiṣtha.**[2]

[1 This king bore the name of *Aśva-pati*, and it was he who educated his nephew Bharata. (G. E. G.)

[2] According to both Sanskrit versions of the *Rāmāyaṇa*, the chief priests who performed the sacrifice (*aśva-medha*) which brought about the birth of Rāma were: Ṛiṣya-Śringa, Vasiṣtha, Suyajna, Vāmadeva, Jāvāli, and Kaśyapa. Viśvāmitra and Bharadvāja had nothing at all to do with it. (G. E. G.)]

E. *Those encountered by Rāma during his travels*

79. **Sudama Tāpasa** (*Atri*? *Sutīkṣṇa*?).
80. **Sukhai Tāpasinī** (*Anasūyā*? *Savarī*?), a female hermit.
81. **Aggata** (*Agastya*, on Mount Kunjara, north of the Vindhyas).
82. **Śarabhanga,** in Daṇḍaka forest.

F. *The Holy Man of Mithilā*

83. **Sudāmantan** (*Sudāman*).

G. *The Holy Man of Khitkhin* (*Kiṣkindhya*)

84. **Angata.**

H. *The three Holy Men of Lankā*

85. **Nārada.**
86. **Gomuda.**
87. **Kāl Tāpasa.**

I. *The three Holy Men of the Trikūṭa* (*Chitra-kūṭa*?) *Mountain*

88. **Sumēdha** (*Vālmīki*?).
89. **Amara-mēśa.**
90. **Paramēśa.**

J. *The Holy Man of the Marakat* (*Malaya*?) *Mountain*

91. **Disbhaya.**

K. *The Holy Men of Kailās* (*Kailāsa*) *Mount*

92. **Gāvin.**
93. **Sukha-Vaḍḍhana** (*Śukla-vardhana*?).

L. *The Holy Man of Kaya-kēs* (*Kaikēya*)

94. **Govin** (*Govinda*?).

M. *The Holy Man of the Kālvās* (*Kraunchālaya*?) *Forest*

95. **Vaj-mṛiga** (*Matanga*?).

N. *The Holy Men whom Hanumān encountered on his way to deliver Rāma's token to Sītā*

96. **Jaṭila.**
97. **Nārada** (the same as No. 85?).

5. The Descendants of Brahma

98. **Mahā Ajatā Brahma** (*Brahmā* the *Prajāpati*), otherwise known as Chaturbaktra ('the four-faced'), king of Lankā (Ceylon) and ancestor of the Demon-King of that island; white, shaped like Brahma (see No. 15).
99. **Malikā**, queen to the above; proper, crowned.
100. **Lastīan Brahma** (*Pulastya*), the first Demon-King of Lankā, son of Ajatā (No. 98); white, four arms.
101. **Śrī Sunandā** (*Iḍaviḍā*), queen to Lastīan; proper, crowned.
102. **Chitra-Māli**, id.; id.
103. **Suvarṇa-Mālaya**, id.; id.
104. **Vara-prabhai**, id.; id.
105. **Rajatā** (*Nikaṣā* or *Kaikasī*), id.; id.
106. **Kubēran** (*Kuvēra*), king of Kālapakṣa and of the Yakṣas, also the god of Wealth; son of Lastīan (Pulastya-Viśravas)[1] and Śrī Sunandā (No. 101); light purple, crowned.
107. **Dabnāsura** (*Tapana*?), king of Chakravāla, son of Lastīan and Chitra-Māli (No. 102), slain by Rāma; dark red, crowned.
108. **Asdhātā (?)**, king of Askan, son of Lastīan and Suvarṇa-Māli (No. 103); white, crowned; four faces, eight arms.
109. **Māran (?)**, king of Solas (Cholas, Sodhas?), son of Lastīan and Vara-prabhai (No. 104); golden, crowned.
110. **Rāvaṇa**, also called Daśakaṇṭha ('the Ten-Necked'), Daśa-Śīra ('the Ten-Headed'), etc., king of Lankā, son of Lastīan (Pulastya-Viśravas) and Rajatā (Nikaṣā or Kaikasī, No. 105), the principal enemy of Rāma; green (or sometimes gold); ten faces, twenty arms.
111. **Kumbha-karṇa**, viceroy of Lankā, son of Lastīan (Pulastya-Viśravas) and Rajatā (Nikaṣā); he is by far the most

[1] In the place of Viśravas the Siamese version has, as a rule, his father Pulastya (in Siamese *Lastīan*) the *Prajāpati* (mind-born son of Brahmā). Pulastya's wife was *Prīti*; whereas Viśravas' wives were Iḍaviḍā, or Ilaviḍā (the mother of Kuvēra, No. 106), and the rākṣasī Nikaṣā or Kaikasī (mother of Rāvaṇa, No. 110, Kumbha-karṇa, No. 111, Vibhīṣaṇa, No. 112, and Sūrpa-nakhā, No. 116). The Siamese version makes Rajatā (Nikaṣā) to be also the mother of Khara (No. 113), Dūṣaṇa (No. 114), and Triśiras (No. 115). On the other hand, the *Mahābhārata* mentions three concubines of Viśravas, viz. (1) Puṣpotkaṭā (mother of Rāvaṇa and Kumbha-karṇa), (2) Mālinī (mother of Vibhīṣaṇa), and (3) Rākā (mother of Khara and Sūrpa-nakhā). (G. E. G.)]

noble-minded of the rākṣasas of Lankā; green, uncrowned (this to show the simple honesty of his character).

112. **Bibhēk** (*Vibhīṣana*), son of Lastīan (Pulastya-Viśravas) and Rajatā (Nikaṣā). He was bitterly opposed to the war, foreseeing therein the ruin of Lankā; was banished by Rāvaṇa, and took refuge with Rāma, by whom he was subsequently invested with the sovereignty over Lankā. Green, crowned.

113. **Khara,** king of Romagal, son of Lastīan (No. 100) and Rajatā (No. 105), slain by Rāma; green, crowned.

114. **Dūṣaṇa**, king of Janapada (Janasthāna), son of Lastīan (No. 100) and Rajatā (No. 105), slain by Rāma; purple, crowned.

115. **Trīsira** (*Triśiras*), king of Maja-vāri (Majerika ?), son of Lastīan (No. 100) and Rajatā (No. 105), slain by Rāma;[1] white, crowned; three faces, six arms.

116. **Sūrpa-nakhā,** daughter of Lastīan (No. 100) and Rajatā (No. 105). She was to a certain extent the cause of the war, since it was she who first spoke to Rāvaṇa of Sītā's beauty and egged him on to steal her from her husband. Green, uncrowned.

117. **Mando-devī** (*Mandodarī*), queen to Rāvaṇa, also at one time the wife of Bālī, king of Khitkhin (Kiṣkindhya); proper, crowned.

118. **Aggī** (*Āgnēyī* ?), queen to Rāvaṇa, daughter of the Serpent-King Kāla-nāga (No. 294); proper, crowned.

119. **Raṇa-baktra** (*Mēgha-nāda*, *Rāvaṇi*), better known as Indrajit ('Indra's conqueror'), prince of Lankā, son of Rāvaṇa and Mando (Mandodarī, No. 117), slain by Lakṣmaṇ; green, crowned.

120. **Bāinā-Sūryavanśa** (*Vaina*, *Vaiṇya* ?), son of Rāvaṇa and Mando (No. 117); id.

121. **Sītā,** daughter of Rāvaṇa and Mando (No. 117), incarnation of the goddess Lakṣmī. By the advice of astrologers

[1] This is the Triśiras mentioned in Araṇya-kāṇḍa (third canto of the *Rāmāyaṇa*), who should not be confounded with his namesake, also three-headed, sometimes called *Triśikha* (a son of Rāvaṇa), referred to later on in Yuddha-k. (sixth canto) as killed by Hanumān. (G. E. G.)]

her parents, deeming her harbinger of ill-luck, had her cast into the sea, but she was picked up by Janaka, king of Mithilā, adopted by him, and married to Rāma.[1] Rāvaṇa, unaware of her identity, became inflamed with her beauty and stole her from her husband, thus bringing about the great war. Proper, crowned.

122. **Kralaya-Kalpa,** son of Rāvaṇa and Aggī (No. 118); orange, crowned.

123. The **Ten Charioteers,** sons of Rāvaṇa by different concubines; variously coloured, all crowned.

124. The **Sahassa Kumāra** (*Sahasra-kumārā* or 'Thousand Princes'), sons of Rāvaṇa by various concubines; id.

125. **Dasa-girivaṇ** (*Daśagrīva* ?), son of Rāvaṇa by a female elephant[2]; green, with a trunk for nose, crowned.

126. **Dasa-giridhara,** brother of the above; dark red, same nose as above, crowned.

127. **Suvarṇa-macc'hā** (*Suvarṇa-matsya* or 'Gold Fish'), daughter of Rāvaṇa by a princess of the sea; golden, a mermaid.

128. **Chandavatī,** wife of Kumbhakarṇa (No. 111); proper, crowned.

129. **Gandha-Mālī,** concubine of Kumbhakarṇa (No. 111); proper, coronetted.

130. **Trījatā** (*Trijaṭā*), wife of Bibhēk (Vibhīṣaṇa, No. 112); proper, crowned.

131. **Benya-kāya** (*Pancha-kāyā* ?), daughter of Bibhēk and Trijaṭā; played an important part in a desperate ruse engineered by Rāvaṇa, by which he thought to end the war, but unsuccessfully; became the wife of Hanumān; id.

[1] Here is a glaring instance of marked discrepancy between the Siamese and Sanskrit recensions of the poem. In the *Rāmāyaṇa* (Bāla-kāṇḍa) King Janaka says: 'As I was ploughing my field, there sprang from the plough a girl, obtained by me while cleansing my field, and known by name as *Sītā* (the "furrow"). This girl sprung from the earth grew up as my daughter.' Elsewhere in that epic Sītā is styled *Ayonijā*, 'not born from the womb.' Hence the story in the Siamese version of her having been borne from Rāvaṇa and cast into the sea, whence she was saved by King Janaka, seems to be a Buddhist accretion, as it savours distinctly of Jātaka lore. (G. E. G.)

[2] The sons of Rāvaṇa, explicitly mentioned as such in the *Rāmāyaṇa*, are, besides Indrajit: *Devāntaka*, *Narāntaka*, *Atikāya* (No. 150 of this list?), and *Triśiras* (see note to No. 115 above). (G. E. G.)

132. **Suvarṇa-kanyumā,** wife of Indrajit (No. 119); proper, crowned.
133. **Yāmali-Varṇa,** son of Indrajit (No. 119) and Suvarṇa-kanyumā; green.
134. **Kanyuvēk,** id.; id.

6. Rāksasas (Demons) of Lankā

135. **Kākanāsura** (the 'Crow Demon' = *Tārakā*), a female relative of Rāvaṇa. She had the power of transforming herself at will into a gigantic crow, and as such made raids upon the holy men studying under the Ṛiṣis Vasiṣṭha and Svāmitra (Viśvāmitra). She was slain, on one of these raids, by Rāma, then a young boy and pupil of the Ṛiṣi last named. Dark purple; a demon mask with a crow's beak; uncrowned.
136. **Svāhu** (*Subāhu, Suvahu*), son of Kākanāsura (Tārakā), slain by Rāma in attempting to avenge his mother's death; green, crowned.
137. **Mārich** (*Mārīcha*), son of Kākanāsura (Tārakā). Commanded by Rāvaṇa to assume the form of a golden stag to lure away Rāma and Lakṣmaṇ, while Rāvaṇa, disguised as a Ṛiṣi, visited Sītā and carried her off. Mārich was shot and slain by Rāma; white, crowned.
138. **Kēśrā** (*Kēśarā* ?), wife of Mārich; proper, crowned.
139. **Nanyavik,** son of Mārich; green.
140. **Vāyuvēk,** id.; indigo blue.
141. **Jiuhā** (*Jivha*), husband of Sūrpa-nakhā (No. 116); brick red, crowned.
142. **Kumbha-kās,** son of Jiuhā and Sūrpa-nakhā (No. 116); dark red, crowned.
143. **Atura-Pisāch** (? -*Piśācha*), a female demon; light red, uncrowned.
144. **Varaṇīsura** (*Varaṇā* ?), id.; green, uncrowned.

7. The Chief Officers of State and Councillors of Lankā

N.B. All uncrowned.

145. **Mahodara,** Rāvaṇa's chief minister; green.
146. **Paunāsura** (*Mahāpārśva* ?), id.; white.
147. **Bhānurāj** (*Bhānuratha* ? = *Kumbhahanu* ?); green.

148. **Vēramba (?)**; light red.
149. **Sukrasāra** (*Śuka* or *Śukanāsā* ?), disguised himself as a monkey and entered Rāma's camp, was found out and ignominiously punished; green.
150. **Iddhi-kāya** (*Atikāya*); light purple.
151. **Mahā-kāya** (*Mahākāya*); dark purple.
152. **Asura Kampan** (*Kampana* ?)[1]; green.
153. **Varavāsura** (*Vajramusti* ?); dark red.
154. **Nanda-chitra (?)**; indigo grey.
155. **Nanda-bairī (?)**; blue black.
156. **Kāruna-rāj (?)**; light red.
157. **Sukhāchara** (*Sukarṇa* ?), deserted from the field of battle, subsequently compelled to transform himself into the semblance of Sītā, in which character he was beheaded by Indrajit on the battle-field, which caused Lakṣmaṇ to pause in his attack; green.
158. **Kāla-sūra** (*Kāla-nēmi* ?); black.
159. **Nanda-sura (?)**; white.
160. **Raṇa-sakdi** (*Raṇa-śakti* ?); pale orange.
161. **Raṇa-siddhi**; dark brick red.
162. **Nanda Yakṣa**; dark blue.
163. **Roma-chakra**; red.
164. **Bada-kāvī** (*Vadha-kāvya* ?); yellow.

8. Guardians and Outpost Officers of Lankā

N.B. All uncrowned.

165. **Kumbhāsura,** outpost officer at Mount Marakat;[2] green.
166. **Ṛiddhi-kāra,** guardian of the aerial frontier; light red.
167. **Sāranta-dūta** (*Sāraṇa*), chief of the scouts; white.
168. **Vijuta** (*Vidyut* = *Vidyuggihva* ?), guardian of the sea-shore; pink, shaded with crimson.
169. **Vāyu-baktra,** ibid.; bluish grey.
170. **Akas-talaya** (*Prahasta* ?), guardian of the city of Lankā; light red; four faces, eight arms.
171. The **Ocean Demon,** a female (*Sinhikā*), guardian of the ocean frontier; dark red.

[1] In the *Rāmayaṇa* three rākṣasa chiefs are referred to with similar names, namely, *Kampana*, *Akampana*, and *Sankampana*. (G. E. G.)

[2] Either *Kumbha* or *Nikumbha*, both sons of Kumbhakarṇa (No. 111). (G. E. G.)

9. The Descendants of Brahmā in Pātāl (Pātāla, the Lower World)

172. **Saha-malivan,** king of Pātāl (Pātāla, the Underworld), ancestor of the Rākṣasa kings of Pātāl; white, shaped like Brahma, with four faces and eight arms.

173. **Mahā-Yama Yakṣa** (*Yama*),[1] king of Pātāl, son of the above, first Rāksasa king (a sort of Pluto or Minos); red.

174. **Chanda-prabhā,** queen to Yama Yakṣa; proper, crowned.

175. **Maya-rāva** (*Maya*[2]), king of Pātāl, son of Yama Yakṣa. Allied himself to his cousin Rāvaṇa of Lankā, and carried off Rāma from the camp to the Lower World. Hanumān followed Rāma, whom he rescued, and Maya-rāva was slain by the monkey-chief. Light purple.

176. **Birā-kuan** (*Vajra-kāmā*), daughter of Yama Yakṣa. It was with her help that Hanumān was able to effect an entrance into the place where Rāma was kept prisoner; proper, crowned.

177. **Vaya-vik (?),** son of Birā-kuan (Vajra-kāmā). He was kept prisoner by his uncle Maya-rāva (No. 175), until freed by Hanumān. He was invested by the monkey chief with the kingdom of Pātāl, after having sworn to observe neutrality in the war between Rāma and his cousin of Lankā. Dark purple, crowned.

10. The Chief Officers of State in Pātāl

178. **Chitra-kula** (*Chitra-gupta*), the recorder; sable.

179. **Chitra-bairī**; white.

180. **Trī-Bada**; dark red.

181. **Megha-nāda**; dark grey.

11. The Descendants of Brahmā in various kingdoms, i.e. outside Lankā

182. **Rajatā-sura,** consort of King Khara of Romagal (No. 113); proper, crowned.

183. **Mankara-karṇa** (*Makarākṣa*), prince of Romagal, son of Khara, slain in the war by Rāma; supposed to be the

[1 Here Viprachitti, king of the Dānavas, seems, however, to be implied, who was father to the next. (G. E. G.)

2 Evidently *Maya*, son of Viprachitti. He was the father of both Vājra-kāmā (No. 176) and Mandodarī (No. 117), wife of Rāvaṇa. He was, moreover, the architect and artificer of the Asuras. (G. E. G.)]

incarnation of the bull Darabhī (*Dundubhi*, No. 299); green, crowned.

184. **Sĕng Āditya** (*Aṁśa*?), prince of Romagal, son of Khara (No. 113), slain in the war by Rāma. He possessed a burning-glass, with which he could destroy his enemies, but the glass was obtained by a ruse by Angada from the god Brahmā before its owner could make use of it. (The name of this character is an entirely Siamese one, meaning 'sun rays'; original Sanskrit name unknown.) Red, crowned.

185. **Vichitra-Bairī,** Military Governor to Sĕng Āditya. It is not clear whether he was of Brahma descent or not. Green, uncrowned.

186. **Viruṇya-Champang** (*Varuṇya*?), king of Janapada (*Janasthāna*), son of King Dūṣaṇa (No. 114). He made a long fight with Rāma and his forces, but seeing himself vanquished, he ran away and hid in a bubble in the sea, where Hanumān pursued and finally slew him. Dark blue.

187. **Viruṇya-mukha** (*Varuṇya-mukha*), son of Viruṇya-Champang. Commanded a small force against Lakṣmaṇ, who captured him, but let him go on account of his extreme youth. The boy subsequently joined the army of his cousin Indrajit (No. 119), and was placed in temporary command, disguised as Indrajit, whilst the latter hid himself amongst the clouds to let loose his serpent noose against Lakṣmaṇ. Green, a young boy with a topknot.

188. **Trī-mēgha** (*Trimēgha*), son of King Trīsira (*Triśiras*, No. 115), of Maja-Vārī; dark red, crowned.

12. The Allies of Rāvaṇa (all Rākṣasas)

N.B. These were nearly all slain in the war.

189. **Chakravati** (*Chakravartī*), king of Malivan; white; four faces, eight arms.

190. **Vajnī-sura** (*Vājinī*?), consort of the above; proper, crowned.

191. **Suriyā-bhava** (*Sūrya-bhava*?), son of Chakravati; red, crowned.

192. **Pralaya-chakra (?),** son of Chakravati; light purple, crowned.
193. **Nanyu-baktra (?),** id.; green, crowned.
194. **Ratana-mālī,** daughter of Chakravati; proper, crowned.
195. **Subin** (*Supina, Suvinda* ?); green.
196. **Viṣṇu-rāj**; blue purple.
197. **Vaya-Krai sura** (*Vyāghra* ?); dark purple.
198. **Asura-batra**; black, white hair.
199. **Māra-krapil** (*Mara-kapila*); red.
200. **Mēghāsura**; dark grey.
201. **Nanda-kāra**; indigo blue.

The above seven are the chief state officers of Malivan.

202. **Asura Rāhu,** air scout of Malivan; green, uncrowned.
203. **Magha-vāl** (*Maghavān*), guardian of the fire frontier of Malivan; dark red, uncrowned.
204. **Kāla-sura,** guardian of the water frontier of Malivan; black, uncrowned.
205. **Satalung,** king of Chakravāla; light red, crowned.
206. **Baichitrāsura** (*Vicitra* ?), king of the Asuras of Mount Trīkūṭa (*Trikūta*) below Mount Sumeru; white, crowned.
207. **Śraddhāsura,** king of Astanga; bright red, crowned.
208. **Haskama-Māra (?),** king of Turam (*Toraṇa* ?); dark purple; seven faces, crowned.
209. **Mahāpāl-Bēdhāsura,** king of Mahā-Chakra; green, uncrowned.
210. **Mūla-balam** (*Mūla-bala* ?), viceroy of Pāngtāl (*Pānchāla* ?); green; four faces, uncrowned.

13. Other Rākṣasas

211. **Sahassa-tija** (*Sahasra-* ?), king of Pāngtāl (*Panchāla* ?). Though not originally a sworn ally of Rāvaṇa, he was drawn into the war on account of his brother Mūlabalam (No. 210), was befooled, and finally slain by Hanumān. White; one thousand faces and two thousand arms.[1] (Needless to say, masks are not really made with a thousand faces.)

[1 Is it here a question of *Kārtavīrya*, king of the *Tālajangha* (= *Pāngtāl* ?) people, who also rejoiced in a thousand heads and one or two thousand arms? This many-headed potentate was, however, killed by Paraśu-Rāma. (G. E. G.)]

212. **Vaitāl** (*Vaitāla*, *Vetāla*), king of Kururath (*Kuru-rāṣṭra*), an ally of Chakravati (No. 189); pale indigo blue, crowned.
213. **Trī-puram** (*Tripura*), king of Soranagara (*Soṛa* or *Chola* ?). Was also drawn into the war and met his death therein; black, crowned.
214. **Anurāj,** king of Mahā-Sinkhara (Śikhara); light yellow, crowned.
215. **Ratanā** (*Ratnā* ?), consort of Anurāj; proper, crowned.
216. **Chanda-vatī,** daughter of Anurāj; proper, crowned.
217. **Dinda-sura (?),** a councillor of Mahā-sinkhara; dark grey.
218. **Nanda-kāra,** keeper of Anurāj's garden; dark red.
219. **Kuvēnu-rāj** (*Kuvēṇu* ?), king of Kālvudh (*Kālava* ?); white, crowned.
220. **Trī-pakkan (?),** son of Kuvēnurāj; green, white.
221. **Kālvaka** (*Kālavaha*), minister to Kuvēnurāj; black, uncrowned.
222. **Kālchakra** (*Kālachakra*), minister to Kuvēnurāj; dark grey.
223. **Gandharva,** king of Tissaśrīsin; green, uncrowned.
224. **Chandā,** consort of Gandharva; proper, crowned.
225. **Viṇa-batta,** son of Gandharva; green, crowned.
226. **Asura Vāyu-baktra** (*Vāyuvaktra*), king of Mahā Vajira-dhānī; white, crowned; is an Asura down to the waist, but the lower part of his body is that of an eagle with nine tails, and is also provided with wings upon the arms.
227. **Virūḷhaka,** king of Mahā Andakāla-nagara (*Andhra*, *Andhakāraka* ?); very dark blue; all his ornaments are made up of poisonous serpents.

14. Celestial Asuras

228. **Malīvakka Brahma** (*Mālyavat*), subsequently named *Malīva-Rāja* by Śiva, who invested him with the sovereignty over the Celestial Gandharvas[1] (celestial

[1] Their king is *Chitra-ratha*, the same personage as above, but with a different name? According to the *Rāmāyaṇa* Mālyavat was the maternal grandfather of Rāvaṇa. (G. E. G.)]

musicians). He was the brother of Chatur-baktra, the first king of Lankā (No. 98), and friend of King Ajapāl of Ayodhyā (No. 47), also a relative of King Sahamalivan of Pātāl (No. 172). He was invited by his grand-nephew Rāvaṇa to act as arbitrator between Rāvaṇa and Rāma. Having summoned both parties to appear before him, Malīva-Rāja, with strict impartiality, gave his award against his nephew, ordering the latter to return Sītā to Rāma. But Rāvaṇa refused to abide by this decision; so, with a curse upon his own nephew and blessing upon the grandson of his great friend, Malīva-Rāja washed his hands of the matter for ever. After that, the war was resumed, and waged to the bitter end. White; Brahma-shaped, four faces.

229. **Rāma-Sura** (*Paraśu-Rāma*, or 'Rāma with the axe'), a celestial demon, who is supposed to cause thunder by hurling his battle-axe at Mēkhalā (see No. 25) in order to obtain the jewel (lightning), with which she for ever lures him. He was vanquished by Rāma, whom he tried to stop on his way back from Mithilā with his bride. Green, crowned.

230. **Asura-Parata** (*Prātaḥ, Prahlāda*, or *Prahrāda*?); dark purple, crowned.

231. **Virāva** (*Virādha*), a particularly ferocious demon, who was vanquished and slain by Rāma and Lakṣmaṇ on their journey from Ayodhyā to the seashore, before the war began; dark purple, uncrowned, his body covered with long spirally curly hair.

232. **Hēranta** (*Hiraṇya*?); light purple, crowned.

233. **Hiranta-yakṣa** (*Hiraṇyākṣa*). This personage really belongs to another story, namely the legend of the *Varāha Avatār*, when Viṣṇu appeared as a boar to fight and kill him, but the legend is incorporated with the *Rāmāyaṇa*; golden, crowned.

234. **Praduta-danta (?)**; dark red, crowned.

235. **Asura Baktra** (*Vaktrayodhin*?); light red, crowned.

236. **Nandu** (*Nandīśvara*?), the porter of the gods; green, uncrowned.

15. Demons who have been condemned by the three chief gods for various offences

237. **Pak-lan (?)**; green, uncrowned.

238. **Kumbala** (*Kabandha*), delivered by Rāma; green, crowned; had a body only down to the waist.[1]

239. **Asura Nandakāla** (*Nandi*), the porter of Kailāsa, was condemned by Śiva to become the bull Darabhā (see No. 297); blue grey, uncrowned.

240. **Kumbhanurāj (?)**; bright red, crowned.

16. Apsaras (Celestial Nymphs) who have been condemned by the three chief gods and delivered by Rāma or his warriors

N.B. All proper, unless otherwise stated.

241. **Pusa-māli**, living at Māyan.

242. **Vānarin**, living near Mount Ākāśa Giri.

243. **Sauvarī**, living at Sāravana (*Śālayana* ?).

244. **Suvarṇa-mālī**, living by the shore of the Mahā-Nadī.

245. **Yakṣa Akṣamūki**, a female demon; green, demon mask.

17. Mortal Ancestresses of Monkeys

246. **Kāla-achanā** (*Ahalyā*), wife of the Ṛiṣi Gotama, who brought her into being by means of occult powers. Misconducted herself with the gods Indra and Āditya, by whom she had Bālī (No. 249) and Sugrīva (No. 253);[2] proper.

247. **Savāhā** (*Svāhā*), daughter of Gotama and Kāla-achanā (*Ahalyā*). For having made her father acquainted with her mother's infidelity she was condemned by her mother to stand on one foot and feed only on air until she should bear a white monkey. She subsequently became the mother of Hanumān (No. 256) by the god Vāyu (god of the Wind)[3]. Id.

[1 *Kabandha* ('the headless') was, as his name implies, a monster without head. This was owing to Indra, when he punished him, having driven his head and thighs into his body. Originally a Gandharva, he was reborn in such a state after his body had been cremated by Rāma. (G. E. G.)

[2] According to the Sanskrit *Rāmāyaṇa* (Yuddha-kāṇḍa, iv) the mother of both Bālī and Sugrīva was Bālā by Āditya or Indra. See also next note. (G. E. G.)

[3] The mother of Hanumān by Vāyu was *Anjanā*, who seems to be the *Kāla-achanā* of the Siamese version. (G. E. G.)]

18. Vānaras (Monkeys)

A. *The Nine Chieftains*

248. **Jāmbuva-Rāja** (*Jāmbavat*), a general and councillor of Rāma, appeared from a bamboo in front of the hermitage of the Ṛiṣi Sukhavaddhana (No. 93);[1] bright red, crowned.

249. **Kākās,** subsequently named Bālī by Śiva, king of Khitkhin (*Kiṣkindhya*), son of Indra and Kāla-achanā (No. 246), acted unjustly to Sugrīva (No. 253) and was slain by Rāma; green, crowned.

250. **Tārā,** wife of Bālī. She was given by Śiva to Sugrīva and entrusted to Bālī to be conducted to his brother. But Bālī was false to his trust and took her to wife himself. Proper, crowned.

251. **Angada,** prince of Khitkhin (*Kiṣkindhya*), son of Bālī by Mando (No. 117), whom Bālī forcibly took from Rāvaṇa.[2] His dying father commanded him to take service with Rāma, and he became one of Rāma's generals. Green, crowned.

252. **Jambhūbān** (*Tāra*), Rāma's general, brought into being by Śiva and given to Bālī, who adopted him as a son; dark rose, crowned.

253. **Sugrīva,** viceroy and subsequently king of Khitkhin (*Kiṣkindhya*), son of Āditya and Kāla-achanā (No. 246), Rāma's chief general and councillor; red, crowned.

254. **Mahā Jambhū** (*Mahā Jambu* ?), king of Jambhū, an ally of Rāma; dark blue.

255. **Uttarā,** consort of Mahā Jambhū; proper, crowned.

256. **Hanumān,** the most trusted general of Rāma, son of Vāyu and Svāhā (*Anjanā*);[3] white, uncrowned.

[1 In the Sanskrit recensions of the *Rāmāyaṇa* Jāmbavat was king of the bears, and it was with an army of these animals that he aided Rāma to invade Lankā. (G. E. G.)

2 According to the *Rāmāyaṇa* (Kiṣkindhya-kāṇḍa, xxi) Angada was 'born of Tārā'. As regards, however, his brother Tāra, I can find no explicit mention of his maternal descent. (G. E. G.)

3 In the Sanskrit *Rāmāyaṇa* (Sundara-kāṇḍa, ii) the birth of Hanumān is related as having taken place from Anjanā, who had formerly been the apsara Punjikasthalā. (G. E. G.)]

257. **Asura P'hat** (*Vāta* ?), son of Hanumān and Benya-kāya (*Pancha-kāyā* ?); light yellow; the face of a monkey but hair of a demon (i.e. curly); uncrowned.

258. **Macchānu** (*Matsyānu* ?), son of Hanumān and Suvarṇa-Macc'hā (No. 127, *Suvarṇa-matsya*, the golden mermaid); white, uncrowned; a monkey, but has a fish tail.

259. **Nila-batta,** son of the god Kālī (No. 37, *Kāla*), but adopted as a nephew by King Mahā Jambhū (No. 254). He started out with Rāma's forces, but quarrelled with Hanumān, whereupon Rāma made him regent of Khitkhin (*Kiṣkindhya*), with orders to send constant supplies to the front. Dark sepia, uncrowned.

260. **Nila-Nala** (*Nīla*), a general of Rāma, son of the god Agni (No. 36); light red, uncrowned.

19. 'The Eighteen Coronets,' i.e. eighteen princes of Jambhū and Khitkhin, all officers in Rāma's forces

N.B. All uncrowned.

261. **Nila-pānan** (*Panasa* ?), incarnation of the god Rāhu (No. 33); sepia.

262. **Nila-ēk** (*Nīla*), incarnation of the god Bināya (No. 7); copper-coloured.

263. **Nila-Khanda** (*Nīlakaṇṭha* ?), incarnation of the god Vighanēś (No. 6); dark red.

264. **Kummitan** (*Kṛathana* ?), incarnation of the god Kētu (No. 34); golden.

265. **Visanta-rāvi** (*Vinata* ?), incarnation of the god Angār (No. 28); crimson lake.

266. **Gomud** (*Kumuda* ?), incarnation of the god Hima-bānta (No. 40); faded rose.

267. **Nila-rāj** (*Nala* ?), incarnation of the god Smudr (No. 39); sea green.

268. **Vimala-vānara** (*Vidyunmāla* ?), incarnation of the god Saura (No. 32); black.

269. **Nila-pāsan** (*Vṛiṣaparvan* ?), incarnation of the god Śukra (No. 31); light yellow.

270. **Mālunda-Kesara** (*Mālinda* ?), incarnation of the god Bṛihas (No. 30); light purple.
271. **Surasēn** (*Suṣēṇa*), incarnation of the god Budh (No. 29); he was the physician in Rāma's army; bright red.
272. **Śatabali,** the scribe, incarnation of the god Chandra (No. 27); white.
273. **Kēyūra,** incarnation of the god Virūḷhaka (No. 43); dark purple.
274. **Māyūra,** incarnation of the god Virūpākṣa (No. 44); light purple.
275. **Kēsara-damālā** (*Kēsari*?), incarnation of the god Vanaspati (No. 38); light yellow.
276. **Śūrakāra** (*Sūryākṣa*?), incarnation of the god Mahā-jaya (No. 42); yellow.
277. **Vaya-putra** (*Hēmākūṭa*?), incarnation of the god Varuṇa (No. 41); dark grey.
278. **Jayambavān** (*Jāmbavan*?), the standard-bearer; incarnation of the god Īśāna (= Śiva, No. 1); he is the standard-bearer of Indra;[1] grey.

20. The Nine 'Tio Bej' or 'Noble Officers' (Monkeys)

N.B. All turbaned.

279. **Mahattha-vikara (?)**; bright red.
280. **Mankancha-vik** (*Vēgadarśi*?); indigo blue.
281. **Dava-batta** (*Dvivida*?); scarlet.
282. **Joti-mukha** (*Jyotirmukha*); dark green.
283. **Pingala**; dark yellow.
284. **Nyāna-vasagandha** (*Gandhamādana*?); white.
285. **Usubha-Sararām** (*Ṛiṣabha*?); dark blue.
286. **Vahu-roma** (*Vīrabāhu*?); yellowish grey.
287. **Nila-Kesī** (*Sarārkiśa*?); rose, black hair.

[1] In the Sanskrit *Rāmayaṇa* I find mention of the paternity of the following *Vānaras* only: Jāmbavan and Vēgadarśi, sons of Brahmā; Jyotirmukha, son of Āditya; Dadhimukha, son of Soma (Chandra), brother-in-law of Sugrīva; Sumukha and Durmukha, sons of Yama; Nala, son of Visvakarman; Nīla, son of Agni; Ṛiṣabha and Hēmākūṭa, sons of Varuṇa; Meinda and Dvivida, sons of the Aśvins (Dasras and Nāsatya); Susēṇa, son of Dhanvantari and father of Tārā; Gaya, Gavākṣa, Gavaya, Śarabha, and Gandhamādana, sons of Vaivasvata (Manu). (G. E. G.)]

21. Miscellaneous

288. **Pragōndharva,** a celestial Gandharva, who volunteered service to Rāma; bright red, crowned, with curly hair all over the body.

289. **Kukhan** (*Guha*), a mortal, chief of the tribe of hunters of Purampura; acted as Rāma's guide during a part of his journey, and subsequently constituted himself guardian of the path from Ayodhyā and the surrounding countries;[1] green, uncrowned.

22. Famous Birds

290. **Suparṇa** or **Garuḍa,** a mythical bird or vulture (half-man, half-bird), Viṣṇu's mount; pale red, crowned.

291. **Sambādī** (*Sampāti*), the elder brother of Satāyu (Jaṭāyu); deep pink.

292. **Satāyu** (*Jaṭāyu*), a great bird, who, seeing Rāvaṇa carrying away Sītā tried to rescue her, but was vanquished and mortally wounded. He nevertheless lingered on till he was able to direct Rāma on his way before he finally died. Green.

23. Famous Serpents

293. **Ananta-nāga** (*Ananta* or *Śēṣa*), the serpent-king, who forms himself into a couch for Viṣṇu to sleep upon.

294. **Kāla-nāga** (*Kāliya* ?), the serpent-king of the lower country, father of Queen Aggī (No. 118).

295. **Danda-nāga** (*Daṇḍa* ?), a serpent-king.

296. **Kambala-nāga,** id.

24. Famous Quadrupeds

297. **Darabhā,** the buffalo king, who was slain by his son; white.

298. **Nila-kāsarā** (*Kṣarā* ?), his wife; black.

299. **Darabhī** (*Dundubhi*), the son of Darabhā (No. 297). It having been prophesied that Darabhā would be slain by his son, Darabhā made it his regular practice to kill all

[1] This is Guha, a bosom friend of Rāma, who was king of the *Niṣāda* (corresponding to the present Bhīl) tribe dwelling in the Vindhya Mountains. His capital was *Śṛingavēra* (instead of which the Siamese version has the vague toponym *Purampura*), and he escorted and honoured Rāma on various occasions. See e.g. Ayodhyā-kāṇḍa, xlvii-lii. (G. E. G.)]

his male offspring as soon as they were born, but Nilakāsarā, knowing herself about to become a mother, ran away from the herd and hid herself in a cave, where she subsequently gave birth to a black male, whom the gods named Darabhī. From the very first Darabhī showed himself a fierce and lusty young buffalo, and his encounter with his father was inevitable, with the result that the father was slain. Darabhī finally encountered King Bālī (No. 249), in whom he met his match, being slain in his own cave, whither he had fled. The misunderstanding arising out of this encounter was the open cause of quarrel between Bālī and his brother Sugrīva (No. 253).[1] Black.

300. **Usabha** (*Vṛiṣabha*, king of kine, *Nandi*), the bull, Śiva's favourite mount; black, with seven white spots, viz. at the four fetlocks, at the tip of the tail, and on the forehead.

25. Famous Horses

301. The **Upakāra Horses**, four in number, belonging to Rāma; white, with red fetlocks and mouths.
302. **Nilabāhu,** Viruṇya-Champang's (No. 186) horse; white body, black head.
303. **Dūṣaṇa's** (No. 114) horse; piebald (black).
304. **Girivarṇa's** (No. 125) horse; piebald (white).
305. **Giridhara's** (No. 126) horse; id.
306. **Nanyavik's** (No. 139) horse; grey.
307. **Vāyuvēk's** (No. 140) horse; piebald (black).
308. **Dasa-bin's** (No. 195?) horse; piebald (brown).
309. **Makuṭ's** (No. 57) horse; white.
310. **Lava's** (No. 58) horse; black.
311. **Māra-krapil's** (No. 199) horse; dark grey.

MAHĀ VAJIRĀVUDH.

[1 See *Rāmāyaṇa* (Kiṣkindhyā-kāṇḍa, viii-ix). It is here related that both Dundubhi and his elder brother Māyāvi (or Mahiṣa, as he is named in ch. xlvi), also killed by Bālī, were sons of Danu. But the misunderstanding which arose between Bālī and Sugrīva is said to have originated at the moment when Bālī was in the cave busy fighting Māyāvi. The slaughter of Dundubhi would have occurred later on, when the two brothers were already enemies. (G. E. G.)]

GROUP XIV

Theatres, etc.

CLASS 77

Theatre Material

Serial No.	Exhibitor.	Description of Exhibits.
	The Royal Commission for Foreign Exhibitions	Masks employed in theatrical plays based on the *Rāmāyaṇa*.
330	,, ,,	Mask of Rāma.
331	,, ,,	,, Rāvaṇa.
332	,, ,,	,, Lakṣmaṇ.
333	,, ,,	,, Bibhēk.
334	,, ,,	,, Angada.
335	,, ,,	,, Sugrīva.
336	,, ,,	,, Hanumān.
337	,, ,,	,, Indrajit.
338	,, ,,	,, Kumbhakarṇa.

GROUP XV

Sylviculture and Forest Industries

CLASS 80

Wood Management

Notes on the Teak Industry of Siam

SECOND only in importance to the export of rice, amongst the industries of Siam comes the trade in teak timber.

Teak timber, or *Tectona grandis* as it is called by botanists, is found in the vast forest regions, which extend all over the north of Siam, above latitude 17°.

The value of teak for shipbuilding and rolling-stock purposes, house-building, and indeed for all purposes of permanent construction work, is so great and so well known as to require little comment here. It will probably suffice to say that the great teak pillars which support the mighty roofs of the tombs of the emperors of the ancient Ming Dynasty in China, a day's journey to the north of Peking, are known to have been erected over two thousand years ago, and may be seen to-day in almost as good condition as on the day of their erection.

Siam teak may also be seen upon the decks of all the great navies and passenger liners of the world, and also forming part of the railway carriages wherever one may travel.

Growing as it does in the depths of the forests, whence it frequently takes a period of ten years from the time when the axe is first laid to the tree till it reaches Bāngkōk, the extraction

of teak is an enterprise which requires large capital and considerable skill in forest work. The Siamese Government has for many years past encouraged this enterprise by the introduction of a Forest Department[1] under the control of various officers of the Imperial Forest Service of exceptional abilities on deputation from the Government of India. This Department issues leases of the various forest areas to the private firms engaged in the trade, who are then permitted to select certain trees by cutting a ring round them near the ground, technically known as 'girdling'. These trees are then left standing for two years to season, when they are felled, logged, and dragged into the nearest floating stream.

The trees, being usually of great weight, have to be dragged through the jungle by elephants, large numbers of which are kept and bred by the firms.

Plate I[2] shows a small nursery with young elephants. Plate II shows a full-grown animal with his rider mounted. Plate III shows an elephant harnessed to a cart, of primitive construction certainly, but which helps to minimize the labour involved in dragging the log along the ground.

Where extraction has to be carried out over hills, through dense forests and muddy swamps, no animal in the world except the elephant can cope with the work. It may easily be imagined, therefore, what care and attention is devoted to these huge beasts. Plate IV shows two at their evening toilet.

On the arrival of the log into flatter and more open country, various other devices are adopted for transporting it to the bank of the stream, whence it may be floated away, the commonest practice adopted being by buffalo cart (Plate V). Owing to the difficulty of transporting cranes or other mechanical devices about the jungles, the work of getting the logs on to these carts is one of great labour. Plates VI–VIII show the usual method adopted.

Supervision of all these operations is carried on by the staff of the various lessees, who make their homes in the jungle.

[1 The first Royal decree issued for the protection of forests is dated November 9, 1897. (G. E. G.)

[2 Forming part of the show of the Royal Forest Department aforesaid, in the series of photos numbered 378*a* in the present Exhibition. (G. E. G.)]

Plate IX shows one such jungle mansion with its proprietor and his stud.

On the arrival of the logs at the floating streams the elephants' labour is not yet over, for owing to the heavy rainfall the water rises and falls very quickly, and the logs sometimes float over the bank at high water or jam together and stick on rocks and mud banks at low water, when the elephants have to be called in again to push them off (see Plates X–XII, the last giving a very good example of a pair of elephants endeavouring to roll a big log by means of their tusks off the bank into the deep water again).

In the depths of the jungle, of course, no trains are available, and Plate XIII shows the usual means of transport. Clothes, food, and everything are piled upon the patient elephant, and as he is not always patient the same articles are often scattered in the water by a vigorous shake or two at the first stream he crosses.

When the logs float out from the side streams into the broad rivers of Lower Siam the difficulties of their transport are mainly over. They are then collected into rafts of, say, 150 logs, tied together, and are made to float down with the stream to Bāngkōk. Plate XIV shows a raft in midstream. At the back may be seen the little hut built by the raftsmen, the bamboo erection being for the benefit of the steersman and lookout, while the piles of cocoanuts are for the raftsmen's food on their long journey. As the rivers are mostly winding, with many sharp corners, the raft is steered by two men who swim all day behind the raft, carrying two long bamboo poles attached to the stern of the raft by a bamboo rope. When it is necessary to swing the raft round a corner they drive the pointed ends of their poles into the soft mud and sand in the bottom of the river, and by hanging on to the top end of the pole form themselves into a living anchor, which checks the stern of the raft and gives the bows time to swing round the corner. Plate XV shows these men with their poles just ready to start. It is one of the sights of the Lower Siamese rivers to see these men, perfectly at home in the water, swimming leisurely down behind the raft, their clothing reduced usually to a large hat to protect

their heads from the sun, while they puff a large cigar, which seems to be quite unaffected by the water.

In this manner the logs arrive at the mooring stations above the busy harbour of Bāngkōk. Here the rafts are taken charge of by a crew of men with oars, who are especially skilled in rowing these great masses of timber in and out amongst the shipping, and though to an uninitiated eye it would appear that the oars could not have any effect in moving such heavy weights, yet they thread their way amongst the shipping with very seldom an accident.

Thus after many years of slow transport and many risks either of being dashed to pieces on the rocks in the rapids and gorges, when the rivers are in full flood in the rainy season, or of being consumed by the great jungle fires which annually sweep over the country in the hot weather, the logs eventually arrive at the saw-mills in Bāngkōk, where they are cut up and shipped to all parts of the world.

The Forests of Lower Siam from a Commercial Aspect

Although the forests of Central and Southern Siam and of the Siamese Peninsula are of great extent and considerable diversity, and contain large numbers of trees yielding valuable timbers of many kinds, they are worked for export to an insignificant extent, and this in spite of the existence of a magnificent network of waterways.

This may be attributed primarily to want of population and the lack of communications generally. The existing population is profitably employed nearer home, and does not need or desire to go into the depths of the forest and engage in laborious and unhealthy work when all their needs are supplied without such expenditure of energy.

It must not be presumed from the above that there is no trade in such woods in Siam. There is a considerable trade, and has been for many years, if not from time immemorial; but it is practically confined to a few woods of exceptional value, such

as rose-wood, ebony, eagle-wood, box-wood, sapan-wood, and one or two scented woods, which fetch very high prices.

This trade is practically limited to the requirements of China and Japan, and is in the hands of Chinese traders.

That in the future, when the country is more populated and opened up by easy communications, there will be a large trade in the many valuable woods which the varying climatic conditions and the forcing character of the Siamese climate produce so lavishly, is practically certain. In the meanwhile one can only wait for this gradual development, being assured that the Government will do anything in its power to foster the trade.

The following is a list of some of the more valuable and well-known Siamese woods, giving, when known, their scientific or botanical names, characteristics, and the uses to which they are commonly put, or might be put.

Those against which a number within parentheses is seen, nine altogether, represent specimens which the Siamese Forest Department has sent to the Turin Exhibition, and these numbers correspond with the serial numbers on those woods in the general list of exhibits.

1. **Kalampāk,** Calambac.
2. **Krishnā,** Eagle-wood.
3. **Chandana,** Sandal-wood.

(1–3: Scented wood.)

4. **Fāng,** Sapan-wood.
5. **P'hayung,** Rose-wood, *Dalbergia* sp. Very hard. Exported largely to China and used for making Chinese black-wood furniture.
6. **Pradū** (No. 370), Padouk, *Pterocarpus Indicus*. Very hard red wood, not easy to work on account of curved grain, very tough; used for gun carriages and hubs and spokes of wheels, and in railway carriage construction.
7. **Marit.** Dark red, nearly black wood, with patches and streaks of light-coloured wood; makes very handsome furniture, but seldom found in large sizes, and scarce.
8. **Khī-lek.** Black wood, hard and heavy, used for posts, very strong and durable.

9. **P'hut.** Resembles box-wood, and might be used for same purposes; not common.
10. **Dĕng** (No. 371), *Xylia dolabriformis.* An iron wood, dark-red colour, very hard, heavy, and durable; exported to China for furniture and fancy box making.
11. **Fāng,** Sapan-wood, *Cæsalpinia Sapan.* A small tree with hard red wood, formerly principally used and exported for making a red dye; also used in India for making small boxes, polishes well.
12. **Takhīen,** *Hopea odorata.* Wood of a yellowish-brown colour; it is very durable, and used much for making boats in Siam; may be used for building and sleepers.
13. **Kabĕk** or **Tabĕk,** *Lagerstræmia flos regina.* A very useful and widely distributed tree, wood light red to pale yellow, suitable for all sorts of building purposes, but does not stand being subjected to moisture and must be preserved from weather.
14. **Khwāu** (No. 372), *Nauclea cordifolia.* A yellow, moderately hard wood, easy to work and lasts well if not exposed to the weather; makes useful planks for box-making and furniture.
15. **Khīem.** A hard, heavy, nearly black wood when seasoned, very durable except near level of ground or surface of water; very good for piling or jetties, and lasts long under water.
16. **Yāng** (No. 373), *Dipterocarpus turbinatus.* A moderately hard wood, trees very large and straight.
17. **Teng** (No. 374), *Shorea obtusa.* A brown, very hard, even-grained wood, very durable, and useful for almost any purpose where strength and durability are required; procurable in large quantities, but trees rather small.
18. **Rang** (No. 375), *Shorea* or *Pentacme Siamensis.* A wood very similar to the former though not quite so hard, but it is more cross-grained and difficult to plane.
19. **Inthanin,** *Lagerstræmia* sp. A yellow-brown wood, hard and durable, very good for interior of houses, doors, window frames, etc., with a handsome grain.
20. **Yŏm** (No. 376), *Cedrela Toona.* A light-red wood

resembling cedar, difficult to season without splitting; the wood is light and easy to work, and makes good boxes; also shingles.

21. **Tum** (No. 377). ?

22. **Sak** (No. 378), Teak-wood, *Tectona grandis*.

W. F. Lloyd.

List of the samples of Timber exhibited by the P'hūket Province, with market quotations for same

N.B. Prices are quoted for squares of 8 by 8 inches by 12 feet = 5⅓ cubic feet.

Catalogue Number.	Name of Timber.	Market Price.		
		£	*s.*	*d.*
391	*Tam-sáu*		7	8
392	Golden *Takhīen* (*Hopea spuria*)		6	1⅓
393	*Khë-fōi* (*Bignonia* sp.)		9	2
394	*Mahāt*		7	8
395	*Lûm-p'hō*		6	1⅓
396	*Inthanin* (*Lagerstrœmia macrocarpa*)		6	1⅓
397	*Khīem*		6	1⅓
398	*P'hlab Kháu*		7	8
399	*P'hang-tān*		4	7
400	Stone *Takhīen* (*Hopea odorata*)		6	1⅓
401	*Nāk-butr*		6	1⅓
402	*P'hayōm Thōng*, or Golden *P'hayōm*		5	4
403	Green-leaved *Takhīen*		6	1⅓
404	*P'hromakhot*		7	8
405	*Sanái*		6	1⅓
406	*Thang*		6	1⅓
407	*Marit*, a black reddish wood, very hard	1	10	7
408	*Tam-sáu Nū*, grows in sea-water swamps		4	7
409	*Kông-kāng*, grows in sea-water swamps		4	7
410	*Tabūn* (*Carapa odorata*)		6	1⅓
411	*Takhīen-Sāi*			
412	*Rak Kháu*			

Notes on the Sriracha Company Exhibits

N.B. Numbers within parentheses correspond to those in the Catalogue.

(Nos. 384 and 385.) *Golden Takhīen* and *Stone Takhīen* (*Hopea odorata*). Attain great size. Suitable for sleepers, shipbuilding, bridge-work, etc. Said by the natives to be as valuable a wood as teak. Boats built of same last for generations. Present price f.o.b. Bāngkōk, about £8 per ton of 50 cubit feet.

(No. 386.) *Yāng* (*Dipterocarpus turbinatus*). Attains great size. An oil-bearing tree. Used chiefly for internal structures. Is to a large extent replacing teak in the local market. Has been introduced into the Europe market to a small extent only as yet, but seems to be gaining in favour. Present price f.o.b. Bāngkōk, about £5 17*s*. 6*d*. per ton of 50 cubit feet.

(No. 387.) *Krabĕk*. Attains great size. Used largely for fishing-boats by natives, also for flooring. Present price f.o.b. Bāngkōk, about £3 per ton of 50 cubic feet.

(No. 388.) *Yai-Bū*. Of fair size. Slightly scented; will not stand exposure to sun or rain. Has a grain somewhat similar to American oak. Good for furniture. Price f.o.b. Bāngkōk, about £3 per ton of 50 cubic feet.

(No. 389.) *Yāng Dĕng* (see *Mai Yāng*). Close-grained. Price as last.

(No. 390.) *Kabĕk* or *Tabĕk* (see *Krabĕk*). A favourite wood with natives for house-building purposes. Always in good demand. Any ordinary specification can be supplied. Price f.o.b. Bāngkōk, about £8 per ton of 50 cubit feet.

Statistical Data on the Export of Timber and other Secondary Produce of the Woods

A considerable amount of timber, especially teak, coming from the forests of North-Western Siam, which lay in the watershed belonging to the Salwin Valley, is floated down the tributaries and the main course of this large river, collected at some distance before it enters the sea, worked in the large saw-mills of Moulmain, and exported as 'Burmah Teak', contributing thereby to maintain the illusion that the teak forests of that country, which have long become notoriously exhausted, still yield important supplies of the valuable timber. Other large quantities of various kinds of woods are exported from the Siamese ports on the Malay Peninsula, about which, however, no exact statistical data are obtainable. Herewith we shall give the only reliable ones, referring to the exports made from the Port of Bāngkōk in 1909.

A. *Wood.*		Quantities.	Value in Francs.
1. Teak squares . . .	Tons	53,224·21	9,442,198
„ planks . . .	„	6,062·03	1,950,546
„ shingles . . .	„	144·33	21,358
„ log and butt ends .	„	757·49	70,804
„ scantlings . .	„	9,008·13	1,534,690
„ unenumerated .	„	6,892·31	930,518
2. Coastwood.			
(*a*) *Yāng* (*Dipterocarpus*) .	Tons	326·22	42,118
(*b*) Various . . .	„	196·30	18,250
(*c*) *Padū* (*Pterocarpus*) .	„	71,072·01	261,144
(*d*) All other wood . .	„	84,824·75	427,238
(*e*) Agilla, or Eagle, wood (*Aloexylon agallochum*)	„	35·58	114,406
(*f*) Sapan-wood . .	„	456·64	47,168
Total . .		233,000	14,860,438

		Quantities.	Value in Francs.
B. *Other Forest Produce.*			
3. Gamboge	Tons	18·57	83,130
4. Stick-lac	,,	427·57	388,616
5. Damar torches (made with the oleo-resin from *Dipterocarpus*)	,,	12·32	3,270
6. Chunam	Jars	120	124
7. Rubber[1]	Tons	3·56	9,190
8. Ivory (elephant tusks, and at times also wild boar's, out of which latter snake-headed bracelets are made in China)	,,	2·16	45,890
9. Elephant bones	,,	6·29	3,912
10. Tiger bones (when pulverized employed in China to refine sugar)	,,	6·55	9,320
11. Rhinoceros horns (highly esteemed in Chinese medicine)	,,	0·09	28,540
12. Elephant and rhinoceros hides	,,	1·88	3,400
13. Fine deer hides	Number	16,989	82,620
14. Common deer hides	,,	62,634	108,800
15. Soft or young deer horns (employed in medicine)	Pairs	347	7,136
16. Old deer horns (with or without the respective skull, generally employed for hat-racks and ornamental purposes)	Tons	18·60	19,544
17. Deer sinews, generally of hog deer (*Cervus porcinus*)	,,	4·95	2,352

[1] In the preceding years the export reached a far higher figure—four and even six times as much in fact. This year, on the contrary, was exceptionally poor, also as regards mangrove and *Angrai* (*Anamirta cocculus*) bark, cutch and krachi wood (medicinal), of which articles no export is recorded from Bangkok.

		Quantities.	Value in Francs.
18. Tiger and leopard skins	Number	16	306
19. 'Armadillo' skins (actually of Pangolin, *Manis Javanica*)	Tons	20·22	75,460
20. Snake skins (of python, etc.)	,,	0·29	960
21. Benzoin or Gum Benjamin	,,	8·06	22,800
22. Pelican quills (employed to make fans) . .	,,	0·196	2,090
23. Plants, various (mostly orchids) [1] . . .		*Entered by value only.*	2,440

Of the articles of produce above referred to there were exported direct to Italy—

		Quantities.	Value in Francs.
1. Teak squares . . .	Tons	820·28	312,872
,, planks . . .	,,	239·09	92,250
2. Coastwood: *Yāng* (*Dipterocarpus*)	,,	25·10	2,500

For the balance of teak-wood which Italy requires for her Navy and other industrial purposes, she prefers to resort to England, the world-mart for this kind of timber, to which

[1] The forests of Middle Siam, as well as those on both coasts of the gulf and the islands, supply multifarious beautiful species of orchids, which are collected for European firms engaged in this line of trade. Noteworthy among them are some varieties of *Cypripedium*, *Cattleya*, *Vanda*, *Oncidium*, *Disa*, *Phaius*, *Selenipedium*, etc.

Among secondary forest produce the following may be mentioned which are not represented in the above export list :—

(1) Honey, which is collected from wild honeycombs in the woods and is almost entirely consumed in the country.

(2) Wax, obtained in the same manner. (N.B. Apiculture in a systematic manner is not yet practised in Siam.)

(3) Feathers of kingfisher (and other rare birds).

(4) Peacock tails.

(5) Otter and hare skins.

(6) A sort of blue stone (resembling a turquoise), said to be derived from the paradise bird, which is used as a charm.

(7) A large number of medicinal and tinctorial roots, barks, herbs, plants, etc., included under the generic designation of 'Goods, Unenumerated' in the Export Tables.

converge the surplus production of Siam as well as the scantier supply that may still be derived from Burma.

Numberless are the saw-mills existing in Siam for the initial working of timber, but for the most part they are still operated by hand. The capital Bāngkōk boasts of nine large steam saw-mills, of which three are owned by Siamese and six by European firms. Another large one has been recently established by the Danish East Asiatic Company at Bān Dōn, on the west coast of the Gulf of Siam, for the working of timber from the forests in that district.

G. E. Gerini.

CLASS 82

Fishing

Siam is, among Far Eastern countries, the one where fish is most plentiful. So plentiful, indeed, that despite the enormous local consumption—for it forms, together with rice, the staple food of the population—there yet remains a surplus available for export to China and to the Malay Archipelago up to a yearly amount of some $4\frac{1}{2}$ million francs. This wealth of water fauna occurs, not only in the rivers and minor streams, canals, marshes, rice-fields, and even in ponds and ditches, but also in the sea skirting the southern shores of the country; and so far as food is concerned, includes, besides fish, molluscs and crustacea as well.

The first place among sea-fish belongs to the *thū* fish (*plā thū*) in Ichthyology, *Cybium guttatum* and *Cybium Kulii*, a variety of mackerel, excellent whether steamed, smoked, salted, or dried. Oil is also extracted from it. Exquisite is the *kurāu* (*Polynemus idactylus*), a kind of merlan, which reaches even 10 kilos weight; and no less appreciated is the *kap'hong* (*Lates calcarifer*), of a similar size. Nor are there lacking the sole (*chalamet*), the mackerel proper (*non-sī*), and many other species unknown to us, among which, very curious and excellent for the table, is the *nok-kēu* or parrot fish, a splendid variety

of *scarus* but a little larger than the hand, and which is round, flat-shaped, and green, with a hooked snout, not unlike the bill of the garrulous exotic bird. There are, moreover, many kinds of skates, one of which, though edible, has at the end of its tail a terrible aculeum with a poisonous sting; and a sea slug or leech (*Holothuria edulis*), better known as *bêche-de-mer* or by the Malay name of *trepang*, which, after having been dried in the sun, is exported to China, where it is highly appreciated for the preparation of one of the numberless soups that form the mainstay of culinary art in that country.

Among the many sea crustacea is a very small variety of shrimp, called *khŏi*. These shrimps are fished with drag-nets; they are salted, pounded into a fine paste, and transformed into a condiment or sauce very extensively used, called *kapí*, but better known by the Malay name of *blachang*.

Numerous varieties of shell-fish are edible, e.g. oysters, mussels, and clam shells, while others are utilized for purposes other than food. From some of them, for instance, especially from mussels, seed pearls of small value are obtained, while the mollusc is dried and exported to China, where it is used in preparing some of the usual multifarious soups. Among the non-edible kinds of shell-fish are noteworthy a large sort of variegated cowrie, called *bīa pông* (*Cyprea tigris*), the shell of which is used by the Siamese in imparting gloss and brightness to freshly starched ladies' skirts; and the very pretty *hŏi mūen* or convoluted shells, highly esteemed on account of their black enamel, red and white speckled, out of which fancy buttons are made for jackets and ladies' blouses. Finally, the common shells and the detritus of them, thrown by the sea on the beach, are collected and transformed, by burning, into lime, though of a poor quality, which is utilized in ordinary masonry building.

Among the curiosities of the sea fauna, which find now and then their way, worthless and sometimes disagreeable intruders, into the local fishing nets, may be mentioned a kind of snake called *samī-lang*, which by night may occasionally be seen shining with a silvery lustre in the gloomy depths of the sea. The fishermen, catching such snakes by the tail, whenever

they discover them in their nets, twirl them about in the air, just as Alpine mountaineers are wont to do with adders, and fling them far away, without fear of getting bitten. A similar summary treatment is dealt to the medusæ (jelly-fish) and to the mango-fish, a kind of diminutive sea porcupine with a rounded body, which it can swell up into the shape of a ball, bristling with sharp pricks. On the contrary, quite harmless and even edible is the *lin-mā* or dog-tongue fish, resembling a sole and better known by the nickname of harmonic fish, which, clinging on to the keel of boats, lulls the navigators by uttering a sound which is not altogether unmusical.

Finally, in some shallows near the shore abounds a most diversified coralline fauna, which is, however, of no great value except in the case of some fine specimens of black coral; while on the surface of the vast expanse floats sometimes in endless patches the excrescence of the spermaceti whale, from which, when collected and dried up, ambergris is extracted.

Commercial products of the marine fauna also comprise: oil, derived from some kinds of small fish and molluscs; ray skins and tails, which are used as files for polishing wood; shark fins; the blades of the sword-fish and saw-fish; turtle shells [1] and the eggs which some gigantic varieties of Chelonians lay on the sandy beach of the mainland or of the islands, and which are greatly relished by gourmets. Again, the air-bladders (*vulgo* 'maws') of some fish are preserved and used fried in oil as an article of food; thus also the eggs of a certain crab (*Limulus*).

Coming now to the produce of freshwater fishing, it will suffice to mention those fish which are of the greatest importance, whether for local consumption or for export.

The first place among these is held by the *c'hōn* fish (*Ophidiocephalus punctatus*). As large as a carp, it is capable of leaping even a couple of metres high above the surface of the water, where it swarms in plenty. Next follow several varieties of *plā duk* or cat-fish, so called on account of the pair of

[1] Besides the horny shells of the *Chelonia imbricata*, highly prized and industrially employed for ornamental work, the breast shell of a variety of tortoise is used, pulverized, and boiled with salt, in medicine, as a poultice for drawing out inflammation, and also as a vesicatory for blistering the skin.

moustache-like feelers which protrude on either side of its snout. This fish has the branchial fins very powerful and sharp-cutting, so that one cannot be too cautious when handling it. Very abundant are the *salit* fish (*Osphromenus nobilis*); the *krāi* (*Clupea* sp.), or freshwater herring; the *mō* (*Anabas scandens*), or climbing perch, which may often be seen leaping about on the mud and on the plants of the banks out of its natural element; the barbel, and other varieties unknown to us. The fish above mentioned are for the most part salted, dried, and preserved both for local consumption and for export.

Some of the largest rivers supply excellent trout. Famed among these is the *wīen* fish of the P'hejburī River, the flesh of which is red like salmon. The Upper Më-Nam and Më-Khōng are celebrated for two large and highly prized varieties of sturgeon—the fish called *bük* and *röm*.[1] Lobsters, crabs, etc., abound also on the lower course of the largest rivers, and especially in the reaches subject to tidal influence.

The non-edible varieties of freshwater fish, which by their peculiarity strike the attention of the foreigner, include the tiny *pūk-pau* (*Tetraodon*), well known and very disagreeable, on account of its sharp mandibles, to people bathing, for it clips off small bits of skin and even flesh, forcing the bathers to retire in earnest, tortured with punctures as painful as those made by a bodkin, which make the body bleed as if it had been under the tender mercies of a myriad of leeches. Of the pretty little fighting fish called *plū kūt* (*Betta pugnax*), mention has already been made (p. 72), so that we may conclude this note with a brief reference to that very interesting small denizen of fresh waters, the *süa* or tiger-fish (*Toxotes jaculator*), better known by the nickname of archer-fish, owing to the fact that it is wont to shoot from its mouth drops of water, with which it strikes, with a precision suggestive of a pea-rifle, the insects on the banks of the ponds in which it is living, and on which it means to prey.

Among the products of the freshwater fishing industry might be mentioned, besides the dried and salted fish referred to above,

[1] The *bük* fish is, however, a Silurian and, more exactly, a variety of *Pangasius*.

a kind of fish paste, rather disagreeable to the European olfactory and taste, called *plā rā*, made with small fish and used as a condiment; as well as fish-oil, which is requisitioned in sauces, etc.

With such an abundance of fishing, which amounts perhaps to half a million tons per annum, and which is quite indispensable because of its forming the only article of animal food of a population almost entirely vegetarian, out of homage to the Buddhist precept forbidding the killing of animated beings, one can easily infer that the implements devised for procuring such a vast amount of viands must be not only most varied but also ingenious. And so they are, in fact, in their primitive simplicity: once they are set up and worked in any place where water flows or remains stagnant, they are sure to yield an unfailing and remunerative result. Dams and weirs are erected for the purpose across small watercourses; fishing-nets are stretched in endless succession athwart the large rivers, and rows of fish-hooks and lines are dipped into the streams in order to ensure multiple and manifold captures. Endless numbers of bow-nets and all sorts of fish-traps are set at every point of vantage. Independently of such fixed appliances, legions of fishermen wade through every stream and creek, or proceed along the banks of the rivers, throwing their casting-nets or working their drag and scoop nets, intent upon the capture of any useful denizen of the water, whether fish, crustacean, eel, or frog. Among these last a small variety called *khīet* is in good demand for the table.

As regards sea-fishing, this is mostly carried out by means of fixed appliances, which are usually gigantic traps and fishing stakes with wings converging in the shape of a V, erected outside the mouth of the rivers or at some favourable point not far from the seashore. On tidal mud-banks and in shallows, however, they often extend for miles seawards.

Dragging nets and seines are nevertheless extensively employed, the former along the beach for catching fish, and the latter out at sea for the capture of shrimps, wherewith the celebrated condiment *kapi* is prepared in numerous factories along the coast.

Peculiar and interesting, because quite unknown to us, though entitled to our acquaintance, is the canoe called *rüa p'hī-lōk* or phantom boat. On one side, below water-level, she is fitted with a white-painted board fixed parallel to the hull, while on the opposite side she is provided with a net set up almost vertically on the gunwale. This weird skiff is slowly paddled in the still darkness of night, close by the banks of rivers or canals, care being taken to keep the side with the white-painted board facing landwards, and to see that the same board is well under water, while the opposite side on which the net is fixed faces towards mid-stream. It then happens that the fish, upon noticing the bright white streak formed by the submerged board, take fright, and finding themselves caught between it and the bank, leap out of the water in order to find an escape towards mid-stream, with the result that most of them fall within the boat, while those which have leaped more boldly and would fall clear over the boat are checked in their aerial flight by the net erected for the purpose. A model of this very curious boat is exhibited in the present Show (No. 246), along with the other simple but ingenious appliances employed with brilliant success by Siamese fishermen. Their nets are really master-pieces whether from the point of view of durability and skilful workmanship of their meshes, or of the process of dyeing employed, in which respects they surpass ours. They accordingly fully deserve the admiration generally bestowed upon them by foreigners.[1]

In the absence of statistical data on the total returns of fishing in Siam, those here subjoined, concerning the export of fish produce from the port of Bāngkōk during the year 1909,

[1] They are dyed a brown colour, which remains fast, either with the fruits of *map'hlab* (*Diospyros* sp.) or with the bark of *samë* (*Avicennia* and *Pongamia*). Siamese nets have invariably been awarded the highest prizes in all world shows at which they have been exhibited. A French expert thus spoke of those which figured at the International Maritime Exhibition at the Havre in 1868: 'Les filets européens ne peuvent soutenir la comparaison avec les filets de pêche siamois. Leur fabrication est toute spéciale et consiste en mailles formées par un certain nœud plat qui évite toute torsion au filet, et dont l'ensemble est recouvert d'un enduit malléable résistant victorieusement à la détérioration de l'eau. Cet enduit, entièrement inconnu, échappe à l'analyse de nos savants; rien jusqu'à présent n'a pu faire découvrir sa composition, et ce serait un grand progrès pour nos pêcheurs que de pouvoir s'en servir.'

may be of some help in forming an idea as to the great importance which the fishing industry has attained in the country :—

	Weight in Tons.	Value in Francs.
Dried and salt fish (*Plā Hëng*) . .	1,300·057	784,440
Salit fish (*Osphromenus nobilis*) . .	468·968	278,836
Thū fish (*Cybium* and *Scomber*) . .	2,061·568	603,842
Salt fish of other kinds . . .	8,151·467	1,833,550
Dried mussels	1,872·110	875,542
Bêche-de-mer (*Holothuria edulis*) .	1·290	1,234
Ray skins (*Trygon Bennettii*, etc., used as files)	7·559	3,490
Turtle shells, soft (*Trionyx*) and hard (*Chelone* and *Testudo*) . . .	0·063	1,628
Shark fins, black and white . . .	1·673	6,034
Total . .	13,864·755	4,388,596

G. E. Gerini.

GROUP XV

Sylviculture and Forest Industries

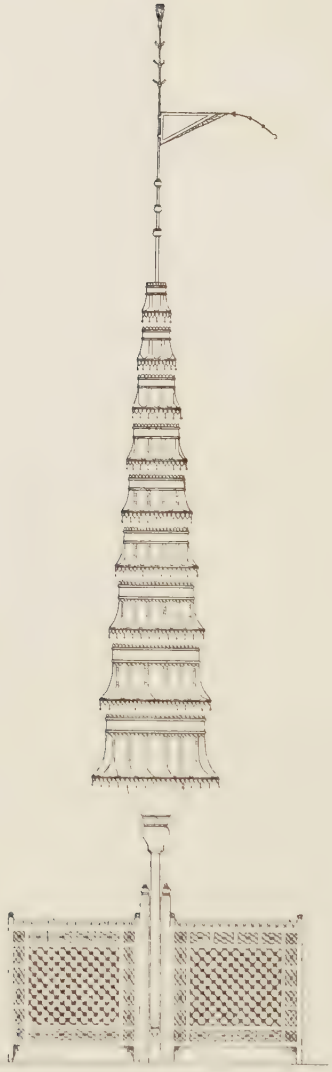
Serial No.	Exhibitor.	Description of Exhibits.
		Class 80. Wood Management
344	Royal Agricultural College	1 bottle of cutch (bark of *Nauclea Gambier*).
345	.. ..	.. damar (oleo-resin from *Dipterocarpus*).
346	.. ..	.. white wax.
347	.. ..	.. yellow wax.
348	.. ..	.. pitch (resin from *Shorea*).
349	.. ..	.. stick-lac.
350	.. ..	Drawing of the lac insect.
351*a*, *b*	East Asiatic Co.	Samples of teak-wood (*Tectona grandis*).
352*a*, *b*	.. ..	.. rose-wood (*Dalbergia* sp.)
353*a*, *b*	.. ..	.. *Padū* (*Pterocarpus Indicus*).
354*a*, *b*	.. ..	.. *Yāng* (*Dipterocarpus* sp.).
355*a*, *b*	.. ..	.. .. ..
356*a*, *b*	.. ..	.. *Tabĕk* (*Lagerstrœmia* sp.).
357*a*, *b*	.. ..	*Rāk* (*Melanorrhea* sp.).
358*a*, *b*	.. ..	.. ..

Serial No.	Exhibitor.	Description of Exhibits.
359*a*, *b*	Royal Agricultural College	*Kān Lüang* (*Dalbergia* sp.).
360*a*, *b*	„ „	*Khī-lek* (*Cassia Siamea*).
361*a*, *b*	„ „	*Inthanin* (*Lagerstrœmia spuria*).
362	„ „	Stick-lac.
363	„ „	Cleaned lac.
364	„ „	Gamboge.
365	Royal Custom Department	Eagle-wood (*Aloexylon Agallochum*).
366*a*, *b*	„ „	Rose-wood (*Dalbergia* sp.).
367	„ „	Ebony.
368	„ „	Stick-lac.
369	Royal Forest Department	*Streblus asper* wood (bark used to make paper).
370	„ „	(2) *Padū* wood (*Pterocarpus Indicus*).
371	„ „	(3) *Dēng*, or red wood (*Xylia dolabriformis*).
372	„ „	(8) *Khwāu* wood (*Nauclea cordifolia*).
373	„ „	(9) *Yāng* wood (*Dipterocarpus turbinatus*).
374	„ „	(1) *Teng* (*Shorea obtusa*).
375	„ „	(4) *Rang* (*Pentacme Siamensis*).
376	„ „	(6) *Yōm* (*Cedrela Toona*).
377	„ „	(7) *Tum* „
378	„ „	(5) Teak-wood (*Tectona grandis*).
378 *bis*	„ „	Series of 15 photographs illustrative of the Teak Industry in Siam.
379	Lim Geok Beng	Uttaradit lac.
380	„ „	Khôrāt lac.
381	„ „	Lakhōn lac.
382	„ „	C'hīeng-mai lac.
383	Chia E, K.	*Palong* (Mangrove or *Rhizophora mangle*), bark for dyeing black.

Serial No.	Exhibitor.	Description of Exhibits.
384*a*,*b*	The Sriracha Co.	(1) Stone *Takhīen* (*Hopea odorata*).
385*a*,*b*	.. ..	(2) Golden *Takhīen* (*Hopea spuria*).
386*a*,*b*	.. ..	(3) *Yāng* (*Dipterocarpus*).
387*a*,*b*	.. ..	(4) *Tabĕk* (*Lagerstrœmia* sp.).
388*a*,*b*	.. ..	(5) *Yai bū*.
389*a*,*b*	.. ..	(6) *Yāng Dĕng* (*Dipterocarpus alatus*).
390	.. ..	(7) *Kabĕk*.
391	Province of P'hūket	(1) *Tam-sau*.
392	.. ..	(2) Golden *Takhīen* (*Hopea spuria*).
393	.. ..	(3) *Khĕ-fōi* (*Bignonia* sp.).
394	.. ..	(4) *Mahāt* (*Isonandra* sp.).
395	.. ..	(5) *Lum-p'hō*.
396	„ „	(6) *Inthanin* (*Lagerstrœmia macrocarpa*).
397	.. ..	(7) *Khīem*.
398	.. ..	(8) *P'hlab Kháu* (*Diospyros* sp.).
399	.. ..	(9) *P'hang-tān*.
400	.. ..	(10) Stone *Takhīen* (*Hopea odorata*).
401	„ „	(11) *Nāk-butr*.
402	„ „	(12) *P'hayōm Thōng* or Golden *P'hayōm* (*Parashorea* sp.).
403	„ „	(13) Green-leaved *Takhīen*.
404	„ „	(14) *P'hromakhot*.
405	„ „	(15) *Sanái*.
406	„ „	(16) *Thang*.
407	„ „	(17) *Marit*.
408	„ „	(18) *Tam-Sáu Nū*.
409	„ „	(19) *Kóng-Kūng*.
410	„ „	(20) *Tabūn* (*Carapa odorata*).
411	„ „	(21) *Takhīen Sāi*.
412	.. ..	(22) *Rak Kháu*.

Serial No.	Exhibitor.	Description of Exhibits.
	Class 82. Fishing	
413	Royal Agricultural College	Model of *Pōḷ* or shallow-sea fishing stakes.
414	,, ,,	,, *Lamuḷ* or deep-sea fishing stakes.
415	,, ,,	,, Low-tide fishing stakes.
416	,, ,,	,, Freshwater fishing enclosure or weir with elevating net.
417	,, ,,	,, *Fïïak-rang* or marine fishing stakes for lobsters and fish.
418	,, ,,	,, net for *Kap'hong* fish (*Lates calcarifer*).
419	,, ,,	,, sea fishing stakes (*Rūa Kāng-kon*) with elevating net, for lobster-fishing on the coast.
420	,, ,,	,, fishing stakes for freshwater creeks.
421	,, ,,	,, hand-net for lobster and prawn fishing in freshwater.
422	,, ,,	,, casting-net for fishing in creeks and rivers.
423	,, ,,	,, bamboo cylindrical fence or fish-trap.
424	,, ,,	,, fish-rod with hook and line.
425	,, ,,	,, *Chib* or triangular hand-net for catching prawn and fish.
426	,, ,,	,, the *Katrā* or *P'hī-lōk* (i.e. phantom) boat for automatic fishing.

Serial No.	Exhibitor.	Description of Exhibits.
427	Royal Agricultural College	Model of *Sūm Takhīeu*, or conical standing basket for catching cat-fish.
428	,, ,,	,, *Takrām* or conical standing basket for catching fish in small watercourses.
429	,, ,,	,, ,, ,,
430	,, ,,	,, *Sūm-lai* for catching fish in freshwater creeks.
431	,, ,,	,, *C'hōn Yāi* or large wicker scoop, for catching prawn and fish at low tide.
432	,, ,,	,, *Bet Rāu* or fish-line with a number of hooks, floated in rivers for angling on a large scale.
433	,, ,,	,, *Rëu dak Pū* or sea-fishing net for crabs.
434	,, ,,	,, *Lōb Yün* or standing basket trap for fishing in small streams.



Rajavati fence with *chhattra* umbrellas.

GROUP XVI

Agriculture

General Remarks

AGRICULTURE, the chief source of Siam's wealth, has from the remotest times been held in the greatest honour in the country, not less so, indeed, than in China, where the auspicious rite of tilling the fields is performed by the hand of the emperor himself. For centuries, in Siam, a high dignitary of the State, appointed by the sovereign, has always presided at the ceremony with great pomp and solemnity.[1] Nowadays it is presided over by the

[1] Since early in the seventeenth century a belief or tradition seems to have been current in Siam that the ploughing festival had been formerly presided over by the king himself. This must, however, refer to several centuries back, for in the Palatine Law (*Kôṭ Maṇḍirapāla*), which dates from the fourteenth or fifteenth century, the performance of the rite of ploughing was already assigned to the P'hyā Baladēv, the head of the Agricultural Department. This rite, as well as the above tradition, is amply referred to by La Loubère in 1687 in the following passages of his book: 'Heretofore the Kings his [King Nārāi's] predecessors did first break up the ground every year, till they left this function to the *Oc-ya-kaou* [*Ōk-yā Khāu*, the "Rice Dignitary"]; and it was attended with great splendour' (p. 43). 'The King of Siam did formerly also set his hand to the plough, on a certain day of the year: for about an age since, and upon some superstitious observation of a bad omen, he labours no more; but leaves this ceremony to an imaginary King, which is purposely created every year: . . . the *Oc-ya Kaou*, or *Oc-ya* of the Rice. He is mounted upon an ox, and rides to the place where he must plough, attended by a great train of officers . . . This masquerade is looked upon as ominous and unlucky to the person. [At harvest time] . . . the *Oc-ya Kaou* offers a sacrifice, in the open field, on a heap of rice-sheaves, whereunto he sets fire with his own hands' (p. 20). Van Vliet, however (in Herbert's *Voyage de Perse*, Paris, 1663, p. 588), says that in Siam in 1617 the ploughing ceremony was already performed by a mock-king called *Ōk-yā Khāu*, and relates (pp. 586-7) how the King of Siam, upon the advice of his soothsayers, had delegated the task in his stead to the *Ōk-yā Khāu*. All this indicates that already at the dawn of the seventeenth century the performance of this rite was no longer a privilege exclusively reserved to the P'hyā Baladēv, and that it was entrusted every year to a different dignitary of the State.

Minister of Agriculture, and has been so ever since the institution of that office. The plough, the bullocks, and the seed are blessed by the Buddhist clergy and the Brāhmaṇ teachers. An auspicious triple furrow is then cut all round a field, which has been previously decorated with garlands of flowers and various charms. The earth turned up by the plough is sprinkled with lustral water, and the sanctified seeds are scattered to symbolize the opening of the sowing season. This solemn ceremony, which is performed early in May, marks the commencement of all field cultivation throughout the kingdom, and more especially of the rice-fields. The harvest is ushered in in no less solemn a manner, and terminates in a burnt sacrifice of plump ears of corn, offered to the gods. The importance attached to these rites, and other less solemn ones of the same nature, is sufficient to show the high place that the patriarchal industry of agriculture holds in the minds of the Siamese people, for whom rice forms the basis of food, as corn does with us.

Nevertheless, to this day field cultivation in Siam is still carried on, for the most part, in the old traditional manner, and, although it has been immensely developed in modern times, as well as in the past, by means of important irrigation works, it is only in very recent years that attempts have been made to introduce more rational methods. These attempts have been greatly assisted by the recently founded Royal Agricultural College, as well as by the example of some enlightened landlords of the present generation, who have already adopted on their farms the most approved agricultural machinery produced by modern industry, and who have also started extensive and experimental culture of novel kinds. The great impulse given to the cultivation of Colonial plants, such as pepper, coffee, cotton, and other fibrous plants, as well as to the production of rubber, gutta-percha, etc., in recent years, is due to the efforts of these well-deserving persons, and to the ever-increasing patronage of the Government, which is always endeavouring to popularize the cultivation of the above produce amongst the rural classes.

Meteorological stations, erected for agricultural purposes,

have been in existence in the capital and chief towns of the kingdom for a good many years; the work of these, limited in the past to the registration of pluviometrical and hydrometrical phenomena, has gradually been extended, and now includes the taking of various observations with the purpose of collecting from the whole country a mass of data on the climate, which cannot fail to be valuable in the cause of agriculture. Much greater attention is paid now than formerly to geology and to the analysis of soil, and a field for experimental purposes has been prepared by the Royal Agricultural College for the study of cultures and of the best methods of husbandry suitable to local conditions.

With a view to improving the agricultural conditions of the country, and at the same time that of the cattle and farm stock, a most successful Exhibition of Agriculture and Commerce was held last year (1910) under the patronage of the King in the capital of Siam. It was so successful in every way that it has been decided to repeat it annually, bringing its organization to a greater pitch of perfection every year.[1]

A report of the exhibition, illustrated by photos, as well as various photographic views of the Royal Agricultural College and samples of field produce sent by the latter for display in the Siamese Pavilion at Turin, will go far to show that in agriculture too Siam has definitely started on the high road of progress and is making rapid strides.

CLASS 87

Husbandry Machines

Although, as has been already said, improved agricultural implements and machinery have been introduced into Siam, and are in use or on trial there, they do not of course figure in this Show, from their not being of local manufacture, but imported from abroad, with the exception of one (not

[1] The second of these Annual Exhibitions of Agriculture and Commerce was opened by the present King on April 10 of this year (1911), and was no less successful than the preceding one of 1910.

represented in the Exhibition), which is an improved type of a native plough devised by a Siamese landlord. It seems to be a success in every way.

The Exhibition is limited to traditional native agricultural implements, which should be of real interest to the public. There are bullock and buffalo ploughs, all made entirely out of hard wood (either red or rose wood, i.e. *Pterocarpus*), except the ploughshares, which are pieces of iron of triangular shape, a little larger than the palm of a man's hand. With so primitive a plough it is of course impossible to cut furrows deeper or wider than a few centimetres. The harrow is nothing but a rake with teeth made of rosewood or some other hard wood, drawn by a pair of bullocks or buffaloes.

CLASS 90

Produce from Extensive Cultivation

I. *Cereals and Leguminous Plants*

Rice.—Rice, of which the country annually produces from six to seven million tons, is the most important agricultural product of Siam. A million tons of this is exported for a return value of more than 170 million francs.[1] From these figures it will be seen that Siam is one of the greatest rice-producing countries in the world. There are many varieties of rice in Siam (more than fifty have been counted, including some glutinous kinds, used as food by the Lāu people in the north), which are cultivated in different ways. These varieties may, however, all be classed under three principal headings, namely—

1. *Hill Rice*, cultivated in little tablelands cleared of jungle for the purpose, shifted after a year or two on to other virgin

[1] Rice constitutes 83·5 per cent of the exports of Siam in value. Last year (1910) has been a record year for rice export, which reached the unprecedented figure of 1,041,000 tons as to quantity, while as to value it amounted to twelve million francs in excess of that of the previous year (1909). A *Report on the Trade of Siam* written in 1678 says (see Anderson's *English Intercourse with Siam*, p. 424): 'This Countrey is the general Granary of the adjacent parts equally if not exceeding any part of the world in abundance of Rice, wherein the neighbouring Malayan coast is yearely supplyed as far as Malaccah.'

soil. Water is diverted from some neighbouring stream or pond for its cultivation. This rice is the best for the table, having the finest flavour, but it is nearly all consumed locally.

2. *Highland* or *Garden Rice*, in Siamese *nā súen*, which is first sown thickly in nurseries or in small patches and then transplanted into paddy-fields (therefore known as *nā dam*, or 'transplantation fields'), which are watered either by the rain, by rivers, or by artificial canals. This rice is the best for exportation. The price of it while still in the husk (paddy) fluctuates between 180 and 200 francs per ton for the first quality, and 170 and 190 francs for the second quality.

3. *Lowland Rice*, or *nā mūang*, which is subject to the periodical inundations of the rivers. This is sown in fields (therefore termed *nā wān*, 'sowing fields') as soon as the rains begin, and is left to grow in the same place. Only very quickly growing varieties, however, are of any value for the purpose, because the stalk must increase in length in proportion to the heightening of the flood, so that the spike of the plant is always above water-level. In some very low-lying places it is necessary for the stem to reach a length of from 5 to 6 metres. This is, of course, the lowest quality of rice, and if it is largely exported, it is not so much for food as for industrial purposes, to be made into starch, for example, or rice powder. It is exported to China, to the Malay Archipelago, and to India for food purposes.[1]

[1] For some years past quantities of *nā mūang* rice, in the husk, have been exported to India, after having been prepared for the Indian market by a process of parboiling, or sterilization by steam, either in Siam, or in the entrepôts in the Straits of Malacca, or at Penang. Thanks to this method the export of paddy (rice in the husk) is increasing enormously, and proves fairly remunerative.

Nā mūang rice is of two kinds, namely, *khāu bau* and *khāu nāk*, light and heavy rice.

Khāu bau (light rice) is the better and fetches a higher price. It is sown on elevated land, and ripens before the *khāu nāk*. There are many varieties of it, viz., *hāng mā* ('horse-tail,' so called because its long ears resemble a horse's tail), *sām-rūang* ('triple-eared'), etc. The *hāng mā* ripens in November before all the others. Very little of it is sown, however, on account of the difficulty of mowing it, as the whole country being under water, boats must be employed.

Khāu nāk (heavy rice), so called because it ripens late in the season, is sown in the lowlands. It grows to wonderful heights, 5 metres or more. The *hōm dūen sām* ('fragrant of the third month') and the *hōm hāng* ('late fragrant') are the principal varieties. Both are mowed in February, the *hōm hāng* being the first.

Within the last twenty years, however, the sowing of garden rice (*nā sûen*) has been attempted on vast expanses of land, endowed with modern systems of irrigation (i.e. artificial canals, locks, reservoirs, etc.), with excellent results. There is every reason to hope that this method of cultivation will spread—its advantages being so palpable with regard to economy of labour, as no transplanting is required—to other districts, which are being reduced to fertility by artificial irrigation and other means for maintaining the level of the water necessary for the prosperity of a rice-field.

Until recently the paddy-fields of Siam have been little more than simple fields, depending for their supply of water upon the rainfall or from inundations, or from both, the harvest being thus completely at the mercy of the weather. If the rains were scarce and the inundations poor, or, vice versa, if the rains were too heavy and the inundations excessive, there was no harvest, and a famine ensued.[1] Famines will now, however, be avoided, or at any rate greatly mitigated, and two harvests will become a practical certainty, thanks to the extensive irrigation works already projected and to the aid of mechanical ploughing in the dry season. At present, even in the most favoured districts, one harvest was all that could be anticipated, and that one was often pretty problematical.

The Government, by the institution of the Royal Agricultural College, with its neighbouring field for experimental purposes, and by the promotion of annual Exhibitions of Agriculture and Commerce, as already referred to above, has greatly assisted in making known to the mass of cultivators the best kinds of rice that can be grown in the country, and induced them to plant such by distributing the seeds gratis to them. The evident advantage of this system is seen in the gradual improvement in the quantity and quality of the rice grown in Siam. It may thus safely be prophesied that the rice exports of Siam will be doubled in a few years, especially if perfected agricultural

[1] The export of rice from Siam had to be prohibited, owing to famines, at the following dates during the last fifty years: December 31, 1844; January 25, 1865; September 19, 1887. This very autumn (1911) rice export had to be forbidden also in French Cochin-China (Saigon) owing to fears of famine.

implements and labour-saving machinery further assist in the task.

As regards the quality of Siamese rice, the Exhibition of Agriculture and Commerce held at Bāngkōk in April, 1910, proved, according to the opinion expressed by some of the principal local merchants, forming part of the Jury, that some qualities of Siamese rice are as excellent as Patna, which is considered to be second in quality only to the finest Carolina, in the United States of America, and that just as high prices might be fetched for Siamese rice in the markets of Europe as for the rice of India or America.[1]

Thirty samples of paddy from the various provinces of Siam figure in the present Exhibition (Nos. 482–511); whilst numerous specimens of cleaned rice, rice flour, etc., are exhibited in Class 98 of Group XVII, to which the reader can refer for further information.

Maize. –This cereal is only produced in Siam in the hills, and in small quantities, mostly in the Southern provinces. It grows into splendid cobs, and is used either roasted or ground into flour. In the latter form it is made into sweet cakes, and is employed more for the confection of dainties than for ordinary food. The northern province of Bisṇulôk has sent a sample of maize to the present Exhibition (No. 475).

Millet.—Nos. 469*a*, *b* are samples of two varieties of this cereal called *khāu fūng* (botanical name *Phalaris communis*). One of these is glutinous. It is mostly used in the confection of sweetmeats, for which purpose the seeds are cooked with raw sugar and cocoanut pulp, the local substitute for butter.

Another variety of millet grown in Siam is known as *lūk dŭai*. We call it 'Job's tears' (*Coix lachryma Jobi*). It was much used formerly as a substitute for rice in times of famine. Now it generally figures in the preparation of sweetmeats, being cooked with sugar and a fatty flour called *pëng man*. Europeans residing in Siam often use it for soup instead of rice or sago.

[1] The *Bāngkōk Times*, the local daily paper, for April 10, 1911, says à propos of the second Annual Exhibition of Agriculture, opened that day: 'Experts declare that the world cannot produce better rice than that, carefully selected, which is grown in the deltaic region of the River Më Nam.'

No. 474 is a sample of this cereal. The seeds are frequently employed for personal adornment by the semi-wild tribes of Indo-China, on account of their globular shape and pearly aspect. The smaller varieties of the seed are in particular request for this purpose, as they cannot be used for food.

Beans and Lentils.—Nos. 467, 468, and 479 are samples of the most common kinds of these, namely, *Phaseolus radiatus* and *Dolichos niger*. These vegetables are used in ordinary cookery as well as in the preparation of some sweet dishes. For the latter they are cooked in cocoanut milk with raw sugar added.

Lotus Seeds.—The lotophagous traditions met with in the pages of Herodotus survive to a certain extent in Siam, where the seeds of the lotus are, if not the basis of, at least an important item in native food, which indeed they completely supplement in times of famine. The seeds used as food are those produced by the *būa lûang* or Royal Lotus (*Nelumbium speciosum*), the sacred lotus of Egypt and of all ancient Eastern lore. Its magnificent fragrant flowers, white, pink, and blue, can be seen gracefully floating upon the tanks and ponds during the day, spreading to a diameter of twenty or more centimetres, and closing at night — splendid, glorious blossoms, which have inspired the native bards with so many imaginative lays. The seeds are oblong, rounded at the ends, about the size of a large Spanish olive, protected by a tough creamy-white receptacle, which turns chestnut brown as it dries. When the outer shell is quite dry it must be removed, a fairly difficult operation. It can only be done with a knife made for the purpose, sharpened sufficiently to split the husk, which is not easy to do without injuring the contents or breaking them up. When the seeds are ready they are boiled with the fatty flour known as *pĕng man* and served. The seeds are also employed, ground to a flour to make cakes and pastry. Sometimes they are parched and eaten as 'pop corn'.

Lʻhung-thalāi or Jelly Fruit.—This is a curious kind of fruit produced by a plant entirely unknown amongst us except to botanists, the *Sterculia scaphigera*, which is very popular throughout the Far East, where it is largely employed in the preparation of cooling drinks; in China it is used medicinally,

as, indeed, almost everything in nature is. As a matter of fact this fruit contains about 60 per cent of Bassorine, and is remarkable for the mucilaginous character of its pericarp when soaked in water. Refreshing drinks are made from it in the following manner: the fruit is soaked in water for twenty minutes to give the mucilaginous pericarp time to swell. It is then easily peeled and the gelatinous substance inside is diluted with water and cocoanut milk, a little sugar or syrup being added. This drink supplies in the Far East the place of our barley syrup, gruels, and the like. The fruit also makes very good sweet jellies. No. 473 is a sample of the fruit.

Cocoanuts.—These being already well known in Turin as a summer drink on account of their milk, require very little explanation. The use to which their pulp is put in the East is perhaps less well known. It is removed from the interior of the nut in shreds with a saw-edged knife made for the purpose. Then the milky juice is squeezed out of it, to be used as a condiment in cooking or as a substitute for butter. Oil can also be extracted from the pulp, in which case the latter is boiled until the water it contains has evaporated. Nothing is then left but the oleous part, which is used in confectionery, as well as for lubricating machinery or for greasing iron wares that need to be protected from rust. The dried pulp is exported and placed upon the market, under the Malay name of *copra*, and forms one of the ingredients of curry or other *sauces piquantes*, which are eaten with boiled rice.

Cocoanut palms are very abundant in the country, especially on the coast and in the Southern provinces, and, besides the nuts, with their above-mentioned uses, they also supply excellent fibre for the manufacture of ropes. Every now and then, inside the nuts, a pearl-like concretion is found, which is very popular as a fairly cheap gem. No. 515 is a rather fine specimen of a Siamese cocoanut, even if it may contain no pearl.

No. 611 is a sample of cocoanut oil as employed in perfumery.

Arachis hypogæa. — The arachis, or ground-nut, forms, together with the cocoanut, one of the connecting links between alimentary and oleiferous plants. The plant is plentiful in Siam,

where the nuts are either toasted, as customary among us, or used in making cakes. Oil for medicinal purposes is also extracted from them in the following manner, which is so simple that anyone can do it. The nuts are exposed to the sun until the oily matter oozes forth. Then they are wrung out in a cloth to squeeze out the oil, which is not very plentiful. A much better output may be obtained with machinery, and the oil is used in perfumery to prepare pomades, creams, etc., as well as in the manufacture of soap. Samples of arachis can be seen at this Exhibition (see No. 478) and also a specimen of the oil as employed in perfumery (see No. 609).

II. *Oleiferous Plants*

Sesamum or *Tilseed.*—Siam produces two varieties of this plant (*Sesamum Indicum*) in abundance, the white and the black.[1] See Nos. 470 and 471. Siamese tilseed is as highly esteemed on the European markets as that from Bombay. It is cultivated in the upper valley of the Më-Nam and harvested in November. It is locally employed in making sweetmeats as well as for the extraction of oil, which is used medicinally. For the last-named purpose the seeds are pounded very fine, and exposed in basins to the torrid heat of the sun, then they are wrapped up in a piece of cloth, which is repeatedly squeezed out. Nowadays, however, more efficacious mechanical means have been adopted for more thoroughly extracting the oil out of them on a larger scale, and this finds employment in perfumery as well as in soap manufacture. No. 610 is a sample of the oil.

Large quantities of tilseed are exported to Europe, especially to France, where the oil extracted therefrom is used to adulterate olive-oil or for illuminating purposes, as well as in soap manufacture. The lamp-black obtained from burning tilseed oil is employed in China in making the very best quality of the famous ink known as China ink.

[1] The black variety is registered in the export bulletins as 'Niger seed', a product of the *Guizotia Abyssinica*, of which it is possibly a variety; the latter is largely cultivated in Indo-China for the same uses as sesamum, and the oil obtained from it is similar to sesamum oil.

III. *Dye Plants*

Rottlera.—Of the numberless, and often very valuable, dye plants that grow in Siam—specimens of the produce of one of which are on view in Class 119—there is exhibited in this section of extensive culture, under No. 476 only, a sample of the berries from the plant *sët*, known botanically as *Rottlera tinctoria*, which yield a brilliant scarlet dye. The usual domestic process for extracting the dye is as follows: the berries, wrapped in a cloth, are dipped into a basin full of boiling water, which dissolves the colouring matter contained in them. The operation is facilitated by repeatedly squeezing the cloth, so that the dye is forced out of the berries. The liquid is chiefly used for dyeing the beautiful scarlet scarfs worn by Siamese women across their shoulders.

IV. *Fibrous Plants*

Cotton.—Seeds of the Siamese cotton plant—which differs in some respects from the Western variety—are exhibited under No. 480. The plant is smaller and slenderer than ours, and has a shorter life, limited to only two or three years; but it fructifies earlier, in fact but three months after it has been sown. The seeds are separate, and not close, almost adhering to one another, like the seeds of the Western plant. The wool, although consisting of fairly short filaments, yields when twisted a much stronger thread than ours.

There are three chief varieties of the Siamese cotton plant. The first, in order of size, is termed Bisnulôk cotton, because of its being largely cultivated in the province of that name. Its stem is of a reddish colour, hairy towards the top, and the cotton it produces is very similar to the cotton of Georgia. It is probably the variety called *Gossipium hirsutum* by botanists.

The middle-sized variety of the plant is distinguished by two sub-varieties, one of which has a reddish stem and the other a green stem. In other respects it resembles the larger plant, except that the thread supplied by the down is even stronger. It is largely cultivated in the provinces of Upper Siam.

The third variety is the smallest, having very small cordate leaves. The stem is reddish and, in growing, puts forth

so many offshoots that it can no longer bear their weight, with the result that it bends down to the ground. As it is not particularly productive, its cultivation is being gradually abandoned in favour of the two preceding varieties.

Cotton is exported from Siam in fairly large quantities, either in a raw state or carded.

Tree cotton or *kapok* is also plentiful in the country (see special note, Group XIX, Class 127).

Pō, or Siamese hemp, No. 477, is a sample of that most useful plant *Paritium macrophyllum*, which is a native of Siam. It yields excellent fibre, similar to that of hemp and of *ramie*, which latter is also cultivated in the country. When the *pō* plant reaches maturity it is denuded of its fibrous bark, which, after having been dried in the sun, is made into ropes and cords. It is also used in skein form to tie the oars of boats to their wooden props. It is strong and capable of great resistance, like the famed Manila hemp, and accordingly deserves the attention of all business men who are concerned with the textile industries. One of its seven varieties, named *pō kachau*, is vulgarly termed 'black hemp'. For further particulars see the special note to Group XIX, Class 127.

Pān, or *ramie*, China Grass (*Boehmeria nivea tenacissima*). This fibrous plant has hitherto been cultivated almost exclusively in the northern provinces of Siam. The season for it is from May to September. It attains a height varying from 1 metre 10 centimetres to 1 metre 50 centimetres. The peel is removed from the stems, when cut, and dried in the sun. It supplies an excellent fibre, of which some samples are shown in Group XIX, Class 127.

V. *Narcotic Plants*

Tobacco.—In this section samples of tobacco seeds from different provinces of Siam are exhibited (Nos. 512-14); the manufactured products are shown in Class 124. The plant is very extensively grown in Siam, over no less than forty-two districts, mostly in the north and centre of the kingdom, and its cultivation forms one of the most important local industries. The consumption of the leaf is enormous, especially in cigarette

form, for the natives all smoke, from their babyhood upwards. A curious local scene may often be witnessed of a sucking child, scarcely three years old (in Siam children are not weaned before they are three), smoking a cigarette between its meals, as it lies in its mother's arms.

Tobacco is sown in September, and the leaves gathered in December. The best leaf comes from the province of P'hetchabūn and from the Koḥ Krāng district. The manner of treating the leaves is capable of much improvement, especially if the tobacco is to be made to suit the Western taste. As to the bettering of the quality, experiments have already been made under the auspices of the Royal Agricultural College with seeds from Deli (Sumatra), Manila, Cuba, and Halifax (U.S.A.), in order to find out which kind is the best to grow in the country, with a view to its introduction.

Besides tobacco for smoking, a sweet-leaved variety of the plant, of a yellowish colour, is very largely grown in the country, especially in the southern province of Samudr Songkhrām (*vulgo* Më Klōng), which is largely used in betel-chewing. It is also employed to rub the teeth, as it is believed to counteract the disagreeable smell caused by the constant chewing of the betel.

Statistical data on the Export of Produce from Extensive Cultivation

The following figures, relative to the year 1909, represent the export made of such produce from the Port of Bāngkōk:—

	Tons.	Value in Francs.
Paddy[1]	26,723	2,710,072
P'hungthalāi Seed (fruits of *Sterculia scaphigera*)	16	6,620
Beans and Peas	389	51,664
Copra (the dried pulp of the cocoanut) .	45	15,178
Cotton, cleaned and uncleaned . .	590	213,984

[1] For rice (husked), see Group XVII, Class 98 below.

	Tons.	Value in Francs.
Tilseed [1]	80	19,954
Niger Seed [1]	50	16,480
Tobacco	12	1,690
Lotus Seed	47	27,150
Onions	1,991	301,406
Tamarinds	149	25,158
Pommelos or Pumelows (*Citrus decumana*) (number)	1,198,450	78,872

N.B. For Drugs, etc., see Group XVII, Class 100 below.

CLASS 92

Gardening Implements, Cutting Utensils, etc.

A fairly complete collection of cutting implements, such as are employed by Siamese agriculturists, will be found in this section. The collection is interesting on account of its originality, the more so because the pieces are all of local manufacture and origin, as well as the metal of which they are made. They are the kind of tools that would be for sale in any market, and comprise many varied types, quite new to us of the West. They range from the long-handled sword, which every countryman wears hanging from his girdle, ready to chop down the plants, branches, or lianas he requires, or which impede his path in the jungle, to the little knife he uses to split the areca-nuts he is always chewing, along with the betel leaves prepared for the purpose. All these utensils come from the provinces of Ayuddhyā and Nagara Rājasīmā (*vulgo* Khòrāt), where there are famous native blacksmiths. The forges at Bān Araṇyik, near Saraburī, are especially renowned for the excellent cutlery they produce.

[1] This has been an exceptionally poor year. The exports of this produce in the two preceding years reached the following figures:-

1907	Tilseed	Tons 767.	Value, Francs	184,030.
	Niger Seed	,, 195.	,, ,,	49,280.
1908	Tilseed	,, 564.	,, ,,	134,194.
	Niger Seed	,, 187.	,, ,,	35,700.

CLASS 95

Silkworm Culture

Silkworms have been reared in Siam from the earliest times, and their precious products worked and exported since the first centuries of the Christian era. A Chinese ambassador who visited Kamboja in 1296–7 relates that the Siamese raised silkworms and wore silken nether garments of dark tussore which the Kambojans were in the habit of buying from them. According to old Siamese chronicles the district of P'hattalung or Talung (on the west coast of the Gulf of Siam) sent a tribute of silk, which proves that sericulture had been developed, especially in the Siamo-Malay Peninsula, the ancient Golden Chersonese—as is further confirmed by later records—by the Siamese, because the culture of silkworms and mulberry-trees was always unknown to the Malays. Sericulture was extensively practised also in the north of Siam among the Lāu people (the junior branch of the Siamese race), and to this day the provinces of Khôrāt and Nān are the ones where most silkworms are bred and where silk is produced in the largest quantities.[1]

Until the establishment at Khôrāt (Nagara Rājasīmā) of the first Provincial Station for experimental Sericulture, the Siamese methods of silkworm-rearing remained quite primitive, and very little care was exercised in the selection of breeds. Instead of the hurdles which we use, the worms were kept on ordinary trays, made of bamboo or plaited rattan; they made their cocoons on similar trays with vertical compartments. The cocoons were flabby and almost as thin and transparent as spiders' webs, resembling floss. It is true that the native silkworms are small and semi-savage, very different from ours, but resembling very closely the East Indian breeds. The mulberry-tree is small too, being a dwarf variety of the *Morus Indicus*. For samples of its leaves see No. 462. Nos. 457 and 458 are

[1] In 1618 George Ball, the President of the East India Company, at Bantam, wrote that in Siam 'there was abundance of silks' (see Anderson, *Engl. Int.*, p. 70).

Gervaise, who resided in Siam 1681-4, relates (*Histoire du Royaume de Siam*, Paris, 1688, p. 137) that the king (Nārāi) promoted to a large extent, in several parts of his kingdom, the rearing of silkworms.

trays for the silkworms, as described above, and covered trays used for breeding. Nos. 459 and 461 are samples of the two kinds of Siamese cocoons, the yellow and the white, and of chrysalides or pupæ preserved in alcohol. In Siam, as elsewhere in Indo-China, the chrysalides are fried and eaten, after the silk has been wound off the cocoons. They are said to be excellent, and a dish of fried silkworms is also considered a great delicacy.

Of recent years the Government has done a good deal to foster the local silk industry and develop it on modern scientific lines, by the institution of a section for Sericulture, under the immediate control of the Agricultural Department of the Ministry of Lands and Agriculture. Provincial Sericulture Stations and Experimental Farms have been established, first at Khôrāt, and next in other districts of Eastern Siam, which, from time immemorial, have been the centres of silkworm-breeding. At the present day there are ten of such institutions, of which eight are branches of the two head stations. They are governed by experts, half of whom are Japanese and half Siamese, the latter being certificated pupils of the School of Sericulture, belonging to the Royal Agricultural College of Bāngkōk. Cross-breeding of Siamese silkworms with the best Japanese silkworms has been tried at these experimental stations with most satisfactory results; the cultivation of the mulberry-tree has been greatly improved, and modern methods and implements have been introduced in the reeling and weaving of the silk. Most of the work at these stations is done by women and girls. The School of Sericulture is largely attended by girls, and a course of instruction lasts three years. From 1904, when the school was opened, up till now, more than six hundred young women have come out of it with diplomas, and these are now scattered over the silkworm districts, imparting to others the knowledge they have received. The result has been a considerable improvement in the quality of the cocoons, and a correspondingly larger production of silk. The work in connexion with the latter, which is now carried on in a rational manner, has been enormously facilitated and accelerated by the modern tools and machinery imported from abroad, chiefly

from Japan. Thanks to all these improvements, the export of raw silk, which, ten years ago, at the Port of Bāngkōk, rarely exceeded in value fifty thousand francs a year, has of late reached a value of nearly a million francs, while the export of both raw silk and silk piece goods is increasing. Formerly silk was only manufactured in Siam for quite local uses. The following notes which have been supplied by the Royal Agricultural College will throw further light on the present condition of silkworm culture in Siam.

G. E. Gerini.

Note on Silkworm Culture in Siam

(Translated from the original Siamese)

Breeds of Silkworms indigenous to Siam.—There are two, the white and the striped, producing respectively white cocoons and yellow cocoons. The breeds are both domestic, and no wild silkworms exist in the country.

Silkworm Eggs.—When fresh they are of a milky-white or light-yellow colour. This remains until they begin to hatch, when it turns to a pale greyish-blue. In shape they are a flat ovoid.

Average weight of 1,000 eggs	. .	0·04527 gram.
,, longitudinal diameter	. .	1·15 mm.
,, transverse ,,	. .	0·98 mm.

The eggs are smaller than either Chinese or Japanese ones, and in consequence produce worms of more slender body.

Hatching of the Eggs.—The native moths usually deposit their eggs in the evening. They are mostly of the colour already described. At dawn on the eighth day a small black spot appears at the end of each egg. At dawn on the ninth day the eggs turn a light greyish blue colour. On the morning of the tenth day, between 6 and 8 o'clock, the eggs open and the blackish-looking worms come out. If they do not all hatch then, they nearly all do by the next morning. During the ten days which form the period of incubation, the weight of the eggs decreases about 14 per cent. But the diminution in

weight is more apparent on the first two days and the four last About 90 per cent of the eggs hatch; of the 10 per cent lost, 7 are reckoned injured or sterile and 3 empty.

The Worms.—The little worms when born are black, and about 2 mm. long and 0·4 in diameter. The average weight of a hundred would be 0·294 gram.

Rearing of the Worms.—As soon as they are born the worms are moved from the egg cardboard to round, flat trays made of plaited rattan (*kradông*) and fed on chopped-up leaves, which are brought to them fresh every three hours.

There are five stages through which the larva goes in the process of its development, of the following durations: stage 1, lasting 6 days; stage 2, 4–5 days; stage 3, 4 days; stage 4, 4–5 days; stage 5, 9–11 days. Therefore the silkworms reach their full development between the twenty-ninth and thirty-first day after their birth; in the province of Khôrāt, however, situated on a plateau where the climate is not so torrid, thirty-four days are required.

The most rapid increase in the dimensions of the silkworm takes place during stages one and five. At the end of that time (i.e. when they are ready to make the cocoons), the worms weigh five thousand times as much as they did at the moment of birth. The weight of mulberry leaves they consume to attain the last stage of development is reckoned at 25 kilos to each gram of eggs hatched out.

The average losses due to mortality during the raising of the silkworms is reckoned at from 15 to 50 per cent. The average is 28 per cent. The diseases to which the Siamese silkworm is most subject are Pebrine, Flaccidity, Calcination, and Muscardine. The flies, especially in the eastern provinces, where they are most abundant, do them no small amount of harm.

Cocoon-forming.—Siamese silkworms take from one to two days, at the outside, to spin their cocoons, and they remain inside them in a pupa state from seven to fifteen days, according to the district. At Bāngkōk, for instance, the chrysalid state lasts hardly ten days, while at Khôrāt it goes on for twelve. The number of cocoons obtained from a gram of eggs weighs about 1,800 kilos.

The Bursting out of the Moth.—At the end of the above-described period the moths are formed and come out of the cocoons. This usually occurs between 5 and 9 o'clock in the morning. The moths have speckled ash-coloured wings, with one black spot.

Reproduction.—After about six or eight hours the moths begin to breed. When fecundation has taken place the males are thrown away, and the females collected upon sheets of paper or cardboard to lay their eggs. Each moth lays from 250 to 350 eggs.

To sum up: Siamese silkworms go through the various phases of the cycle of their existence in the following periods: embryo, or egg stage, 10 days; larva, or worm, 25 to 32 days; chrysalid, or pupa, 10 to 12 days; moth (image), 2 to 3 days; making up a cycle of from 47 to 57 days.

Number of Harvests.—Siamese silkworms, being polytocous, can be reared and reproduced in quick succession; thus seven or eight harvests of cocoons are possible in the year. But in order to keep the mulberry-trees in a flourishing condition, it is considered advisable to limit the harvests to two or three in the year.

Appearance of the Cocoons.—The shape of a Siamese cocoon is an elongated ellipsoid, tapering and slightly pointed at either end. It is surrounded by much floss.

Each cocoon yields about 200 or 250 yards of silk thread, and the produce of every hundred grams of cocoons may be classified as follows: silken matter, 37 grams; heterogeneous matter, 63 grams; total, 100 grams.

A kilo of fresh cocoons yields about 75 grams of good raw silk, from 40 to 45 grams of inferior raw silk, and from 4 to 5 grams of waste silk.

Characteristics of the Silk.—Of the two above-named varieties of native worms the white is the better, because the cocoons produced by it yield from 27 to 45 per cent of silk more than the others. The bave is much thinner than that of foreign cocoons, and makes a much finer raw silk, of a higher commercial value than that resulting from a coarser thread.

Cross-breeding.—Under the auspices of the Royal School of Sericulture, repeated experiments have been made in crossing

Siamese breeds of silkworms with Japanese. The results have been excellent. The worms produced by this intermixture of breed maintain the good characteristics acquired by it for eight generations or eight consecutive reproductions. After that it is necessary to have recourse to another crossing with Japanese silkworms. The results obtained from the cross-breeds compared with those from pure-bred Siamese silkworms may be compared in the following table:—

Amount of raw silk obtained from 100 cocoons.

	Grams.
1. Siamese silkworms reared by peasants . .	16·58
2. Reared by Royal School of Sericulture . .	62·15
3. Crossed with Japanese yellow cocoons . .	65·17
4. Crossed with Japanese green cocoons . .	76·60
5. Crossed with Japanese white cocoons . .	78·66

The Native Mulberry-tree.—Six varieties of mulberry-tree are cultivated in Siam, but among them two only are given the preference on account of their sturdy growth and the excellence of their foliage, namely, the Gem Mulberry (*mōn kĕu*) and the Black-eyed Mulberry (*mōn tā dam*).

These varieties are generally immune from disease; but, if grown in damp marshy ground, they are often infested with caterpillars and various parasites, whereas in sandy well-ventilated soils they are free from these pests.

The yield of leaves from a small well-kept plantation of mulberry-trees is about 9·4 tons per hectare. The outlay, reckoned from the very beginning, when the ground has to be cleared and tilled, down to when the trees have attained full growth, amounts to about 1,425 francs per hectare. These figures are arrived at on the basis of the cost of the experimental plantation of mulberry-trees started by the Royal Agricultural College, and carried out by means of hired labour.

Experiments prove that 14 kilos of mulberry leaves produce one kilo of cocoons, yielding from 75 to 78 grams of raw silk. Whence it follows that from one hectare of mulberry plantation about 150 kilos of silk may be obtained (and that with but three successive rearings of silkworms a year), which are worth from 6,000 to 9,000 francs.

The Royal Agricultural College.

GROUP XVI

Agriculture

Serial No.	Exhibitor.	Description of Exhibits.
	Class 92. Gardening Implements and Tools	
435*a*, *b*	Nagara Rājasīmā, Province of	Knife for cutting cocoanuts.
436*a*, *b*	,, ,,	Chopper.
437*a*, *b*	,, ,,	Mincing knife.
438*a*, *b*	,, ,,	Knife for general use.
439*a*, *b*	,, ,,	Curved printed knife.
440*a*, *b*	,, ,,	Short heavy knife.
441*a*, *b*	,, ,,	Bamboo knife.
442*a*, *b*	,, ,,	Betel-nut knife.
443*a*, *b*	,, ,,	Agricultural knife.
444*a*, *b*	,, ,,	Square beaver knife.
445*a*, *b*	Ayuddhyā, Province of	Siamese sword.
446*a*, *b*	,, ,,	,, ,,
447	,, ,,	Long-handled knife.
448	,, ,,	Wagger.
449	,, ,,	Lotus-headed knife.
450*a*, *b*	,, ,,	Short sword.
451	,, ,,	,,
452*a*, *b*	,, ,,	Long-handled knife.
453	,, ,,	,, ,,
454*a*, *b*	,, ,,	,, ,,
455	,, ,,	,, ,,

Serial No.	Exhibitor.	Description of Exhibits.
	Class 95. Sericulture	
456	Nagara Rājasīmā, Province of	Tray and cover for silk moths.
457	Royal Agricultural College	.. .. ..
458*a–c*	,, ,,	Stand and tray for silkworm.
459*a–d*	,, ,,	4 tubes of silkworms to cocoon stays.
460	,, ,,	1 panel of cocoon samples.
461*a–c*	,, ,,	3 tubes of silkworms and pupæ.
462	,, ,,	Samples of Siamese mulberry leaves.
	Class 87. Husbandry Machines	
463	Ayuddhyā, Province of	Model of Bullock Plough.
464	,, ,,	,, Buffalo Plough.
465	,, ,,	,, Harrow.
466	,, ,,	,, Earth Breaker.
	Class 90. Produce from Extensive Cultivation	
467	Ayuddhyā, Province of	Seeds of *Thūa Thōng* (kind of *Phaseolus radiatus*).
468	,, ,,	Seeds of *Thūa Khīeu* (kind of *Phaseolus radiatus*).
469*a*	Bāngkōk, ,,	Sample of millet (*Khāu Pāng*).
469*b*	,, ,,	,, ,, ,,
470	Ayuddhyā, ,,	Black Sesamum (Niger) seed.
471	Nagara Rājasīmā, Province of	White ,, ,,
472	Custom Department, Royal	Black ,, ,,
473	Chanthaburī, Province of	*Phung-Thalāi* seed (*Sterculia scaphigera*).

Serial No.	Exhibitor.	Description of Exhibits.
474	Bāngkōk, Province of	*Lūk Dūai* or Job's Tears (coix millet).
475	Bisṇulōk, Province of	Maize (*Khāu P'hôt*).
476	Bāngkōk, Province of	Seeds of *Sĕt* plant (*Rottlera tinctoria*) for dyeing red.
477	Ayuddhyā, Province of	Seeds of *Pō* or Siamese Hemp (*Paritium macrophyllum*).
478	,, ,,	Ground-nuts (*Arachis hypogæa*).
479	,, ,,	Black Beans or *Thûa Dam* (*Dolichos niger*).
480	Nakhōn Sawan, Province of	Cotton seed.
481	,, ,,	Royal Lotus seed.
482-96	Bāngkōk, Province of	Varieties of Paddy.
497-9	Ayuddhyā, Province of	,, ,,
500-6	Nakhōn C'haiśrī, Province of	,, ,,
507-9	Nakhōn Rājasīmā, Province of	,, ,,
510	P'hetchaburī, Province of	,, ,,
511	Prāchīn, Province of	,, ,,
512	P'hetchabūṇ, Province of	Tobacco seed.
513	Samudr Songkhrām, Province of	,, ,,
514	Koḥ Krāng, District	,, ,,
515	Royal Agricultural College	Cocoanut.

Siamese panel with figures of celestials bringing offerings.

GROUP XVII

Food Industries and Products

CLASS 98

Farinaceous Articles and their Derivatives

General Remarks

SIAM is represented in this class by its principal cereal alone, namely rice, which, either as a simply husked or thoroughly cleansed grain, or in the form of flour, is the basis of native food. Rice is also a source of wealth to the country, thanks to the very considerable export which is made of it abroad.

For export purposes the rice is husked in the local steam mills in different ways, so as to obtain the various commercial products described below :—

Ordinary Rice.—Ordinary rice is the result of a single cleaning. It is therefore not quite free from husk, which still clings to it here and there. It is then passed successively through three metal sieves, of varying fineness of mesh, which sort and classify it for trade purposes as follows : Ordinary Rice, No. 1, is rice of the largest grain ; No. 2 is medium-grained rice ; No. 3 is the finest-grained rice.

White Rice.—This is cleansed rice which has gone through two or three huskings, respectively followed by as many polishings, intended to free it from all chaff and to impart to it a pearly-white and translucid appearance, after which it is

passed through three screens of graduated mesh, similar to the ones used for common cleansed rice, whence it comes out classified as White Rice, Nos. 1, 2, and 3.

Broken Rice.—A considerable proportion of rice grain gets broken into little bits during the ordeal of its transformation into white rice. These fragments, according to their size, are classified separately in three divisions, known as Broken Rice, Nos. 1, 2, and 3, and are exported for industrial purposes only, such as the manufacture of starch, or for distillation, with a view to their conversion into gin, brandy, etc.

Parboiled Rice.—This is prepared for the Indian market only, by a special process.

Granulated Rice.—This is white rice in a granulated form, prepared especially for the manufacture of beer.

Sago Meal Rice.—This is rice prepared in yet another manner, which communicates to it the granulated pearly appearance of sago flour.

White Table Rice.—This is choice Garden or Hill Rice, which, on account of its excellence, is the only one used for the table by the well-to-do classes. It is also exported for the same purpose, especially to Europe.

Rice Meal.—This is extensively used much in the same way as cornflour, and more especially to make cakes and pastry: also in the manufacture of vermicelli, which the natives and the Chinese use very largely for soup, or to cook in gravy.

Nearly all the above-described products can be seen at this Exhibition (Nos. 516–29).

Historical and Statistical Notes

Rice is in Siam, as in India, indigenous to the country. Its cultivation dates from the remotest periods. It forms the basis of food in Siam as corn does with us, so much so that the expressions 'sitting down to table' or 'taking a meal' in Siam are translated *kin-khāu*, 'to eat rice.' Movable property is referred to as *khāu-khōng*, or 'household goods and rice'; and being without food is described as being 'without rice'.

On account of its vital importance an auspicious character

is ascribed to rice in the country. It plays a prominent part in all domestic and State ceremonies, is the symbol of fecundity in the nuptial rites and of good luck in others. Exorcistic virtues are attributed to it, and it is considered a protection against all evil influences, the latter especially when it has been parched or purified by fire and scattered over persons or things. The Goddess of Rice is, for the Siamese, what Ceres was to our old forefathers, and it is worshipped on account of the belief that she presides over the growth of that cereal in the fields. Children are taught to reverence her, before meals, with uplifted hands joined in front of their foreheads, as, in many a family at home, children are made to mutter a prayer before partaking of food.

Up to a few decades ago paddy used to be husked in Siam by means of large wooden mortars and heavy double pestles, or with hand mills consisting entirely of wood, including the casing for the mill-block, which was made of interlaced strips of bamboo or rattan. These implements are remarkably interesting on account of their ingenuity.

The first steam rice mill was erected in Siam in 1858, in the down river reaches of Bāngkōk, the capital. It started work on October 22 of that year, and was the harbinger of a new industrial era in the local history of the rice trade. Similar and larger mill works are now to be seen in considerable numbers, not only in the capital but also in the chief villages and towns of the deltaic region where paddy is most extensively grown. In Bāngkōk alone there are fifty-nine, all driven by steam, of which thirty-one belong to Siamese owners and twenty-eight to foreign subjects, especially Europeans.

In these mills the husk of the rice itself, by means of a special arrangement of the fire-grate, is burnt as fuel to supply the necessary steam-power, thus realizing an immense saving of expense. These mills turn out rice fit for export as well as for local consumption.

Nevertheless, a large proportion of the rice which is shipped to Europe has undergone but a single husking. The rest of the cleaning operations are accomplished in vast establishments at Hamburg, Amsterdam, etc., whence the rice is distributed

to the European and American markets, especially those of South America (Argentine Republic, Brazil, etc.). On the other hand, the white rice turned out by local mills in Siam goes mostly to the Malay Archipelago, to China, and even to Japan, where it forms the native staple food.

The export of Siamese rice, in all its forms, is continually on the increase. The following figures refer to the exports from the port of Bāngkōk alone in 1909 :—[1]

	Tons.	Value (francs).
Ordinary or Cargo Rice (roughly husked rice)	109,010	16,777,486
Ordinary or Cargo Rice (broken) . .	12,492	1,239,410
„ „ „ Meal . .	23,162	1,143,756
White Rice (thoroughly husked and polished)	427,621	100,828,154
White Rice (broken)	290,349	41,498,266
„ Meal	78,410	5,960,026
Total . . .	941,044	167,447,098

The prices ruling in the European markets, during the last three months of 1909, for Siamese white rice were as follows :—

	Lire.
White Rice, No. 1, per ton, including freight, etc.	222–34
„ broken „ „ „	160–6
„ „ coarse „ „ „	160–6
„ „ fine „ „ „	148–54
„ Meal „ „ „	120–6·5

[1] In those figures paddy is not, of course, included, the particulars thereon having already been given in connexion with the remarks on Group XVI, Class 90.

CLASS 100

Confectionery ; Coffee, Spices, etc.

General Remarks

In this section Siam is represented by some of her valuable productions, which being of considerable importance deserve some particular mention.

Coffee.—The culture of coffee was introduced into Siam but some sixty years ago.[1] Liberian, Javanese, and other varieties of coffee were successively experimented upon. Some of them proved exceptionally well suited to the soil, especially in the Chanthabūn district on the east coast of the Gulf, where they now thrive and are extensively cultivated. Chanthabūn coffee has, in fact, become famous for its excellence in the European markets, and its export is always on the increase. It would appear that Siamese coffee has a most promising future before it. Its chief features are, very regular and small grain almost like Mocha, fine quality, and delicious flavour.

Nos. 536, 542, and 544 are samples of coffee from Chanthabūn, as well as of other kinds from neighbouring provinces, raw as well as roasted and ground.

Cardamom.—The dried aromatic fruit of this plant (*Amomum xanthioides* and *galanga*), in Siamese *krawān*, is used either medicinally or in the preparation of curry, of which it forms a pleasing ingredient. Nos. 530 and 531 are specimens of it.[2]

[1] Pallegoix already speaks of coffee (op. cit., tome i, p. 144) in 1854, as being then cultivated in Siam. On p. 328 he reckons its yearly export at 12,000 piculs (about 725 tons) at 16 ticals per picul (i.e. fr. 1.30 per kilo, computed on the basis of the tical value at the period). On p. 219 he says: '*L'usage du café commence à se répandre à Siam depuis que le roi et les grands en ont fait des plantations considérables.*'

Samples of Siamese coffee were sent to the Paris Universal Exhibition of 1867, where they found much appreciation on the part of connoisseurs. In 1891 the cultivation of coffee was attempted on the Siamo-Malay Peninsula at a spot 30 miles west of Singora and 45 from Kedah. 35,000 trees were planted, of which 30,000 were still living in 1897 ; but labour difficulties proved a serious drawback, despite the upland proving favourable to the culture.

[2] It was Cecchino Marcello (or Martinello) who, in 1604, first sent *Amomum* (or cardamom) from Malacca to Venice, thus making it known in Italy.

The plant is cultivated in the eastern provinces of Siam, mostly above 15° N. lat., and begins to yield fruit at the end of the fourth year. The capsules when ripe are picked from the stems and separated from the adhering calyx by rubbing with the hands.

Nos. 532, 533, and 542 are samples of *rèu*, that is, hairy or bastard cardamom (*Amomum villosum*), hitherto little known amongst us, and used exclusively medicinally. It has a smell and flavour somewhat like tar, and but little of the piquant aroma that distinguishes the true cardamom. It grows in Eastern and Northern Siam, and the fruit is gathered between the months of May and October.

Pepper.—This is the produce of *Piper nigrum*, a climbing plant extensively cultivated in the province of Chanthabūn, on the east coast of the Gulf. There are two varieties of it: Black Pepper, which is gathered before it is ripe and then dried; and White Pepper, which is gathered when fully ripe, the skin being removed by maceration. Nos. 545 and 546 are examples of both these varieties of pepper.

Black pepper is harvested in February; a second harvest, though considerably smaller, is effected in July. No sorting of it according to weight and quality of grains usually takes place before shipping. The actual price for white pepper is (in Bāngkōk) 1 fr. 40 per kilo.[1]

Siam produces also a considerable quantity of Long Pepper

[1] In 1507 Leonardo da Cá Masser, writing from Lisbon to the Venetian Republic, enumerates pepper among the commodities exported from Tenasserim. During the century next following, pepper from Patāni came much in repute and formed the object of a considerable trade. In 1678 the yearly growth of pepper at Patāni amounted from 1,500 to 2,000 piculs (90 to 120 tons), besides great quantities brought from other places (see Anderson, op. cit., p. 138). According to Burneby's report of the same year (op. cit., p. 145), 'Patani produces great quantities of pepper, which is esteemed the best in India. In Singora 3,000 piculs (180 tons) of pepper yearly may be procured.'

The Jesuit Fontenay, in January, 1686 (see Tachard's *Second Voyage de Siam*, pp. 236, 247), saw a pepper garden of the King of Siam at 2½ miles to the east of Mūang In. La Loubère did not (in 1687) see the pepper plant of Siam, but he remarks, 'The King of Siam, they say, has caused an hundred thousand thereof to be planted.' This probably alludes to the plantation seen by Fontenay. Tachard (op. cit., p. 247) says that thorny trees called *thōng-láng* (*Erythrina*) are employed in Siam as supports for the pepper plant.

In 1822 Crawfurd (op. cit., ii, pp. 113, 162) wrote that 60,000 piculs (*c.* 3,600 tons) of pepper were produced in Siam, of which 40,000 were annually paid into the

(*Piper longum*)[1] and other varieties of Piperaceæ, the fruits of which are not only employed locally for medical purposes and as condiments in native cookery, but also exported in noteworthy quantities.

Nutmegs.—The nutmeg is the kernel or seed of the fruit of the nutmeg-tree (*Myristica fragrans*), and has been cultivated for some time in the province of P'hūket (the island of Junkceylan and neighbouring mainland) on the west coast (Gulf of Bengal) of the Siamo-Malay Peninsula. The fresh nutmeg fruit, which is edible, looks like a peach, and easily splits into two, disclosing the solitary seed or nutmeg, which is surrounded by its aril, scarlet in colour, and known to us, as a drug, under the name of Mace. No. 534 is a fine sample of nutmegs from P'hūket. The actual current price of nutmegs in this district is 17 ticals per picul (60·453 kilos.), which corresponds to about 560 francs per ton.[2]

Other Spices, etc.—Many other drugs are produced in Siam in varying quantities, such as Cinnamom (in the north),[3]

Royal magazines. Chanthabūn pepper was already exported from Siam in 1854 according to Pallegoix (op. cit., tome i, p. 144), who estimated its yearly export at 70,000 piculs (about 4,200 tons), at 10 ticals per picul (op. cit., p. 327). This is certainly a mistake for 30 ticals. In 1892 pepper-planting was extended at Chanthabūn. Nowadays the plantations cover an area of 3,200 rai (= 5,120,000 square metres) in the Chanthabūn district and 70 rai (112,000 square metres) in Krāt. Local prices in July, 1911, ranged from 40 to 42 ticals per picul for white pepper, and from 25 to 27 ticals for black.

On the east coast of the Malay Peninsula pepper cultivation has been introduced also into the C'haiyā district, where the plantations cover at present an area of 4,200 rai, viz. nearly 13½ million square metres. The yield is usually 1 picul of berries to every 100 plants.

[1] The impetus given to the cultivation of Long Pepper in the last seventy years is due to King P'hraḥ Nàng Klàu, the third king of the reigning dynasty (1824-51), who, besides encouraging its cultivation, made a law to the effect that every proprietor of a fruit plantation should pay to the State a tax in kind of Long Pepper, to the amount of one Chinese catty (0·604 kilo), for every plantation situated in the province of Bāngkōk, and of two catties (1·209 kilos) for plantations in the neighbouring provinces. Thus the owners of fruit gardens were obliged to plant Long Pepper between the rows of fruit-trees on their property. His successor, King Mongkuṭ, confirmed the law, so that the cultivation of Long Pepper became general.

[2] Nutmegs, Mace, Cloves, Cinnamom, Galanga, and other spices are enumerated in 1507 by Leonardo da Cá Masser among the exports from Tenasserim, which is, he adds, the chief mart for spices in India.

[3] Exported from Tenasserim since the dawn of the sixteenth century, see note 2 above. In 1687 La Loubère wrote of Siam (op. cit., p. 13): 'They have the cinnamom-tree, inferior indeed to that of the Island of Ceylon.' This

Cloves (in the south),[1] Ginger (root of the *Zingiber officinalis*), Galangal (the aromatic rhizome or tuber of the *Alpinia galanga*,[1] etc.), Tamarind, Anise, Liquorice, Turmeric (root-stock of the *Curcuma longa*),[2] Cayenne pepper (*Capsicum*), etc., all of which are largely employed as condiments in cookery, as well as in the preparation of medicines. Samples of several of them will be found at this Show under the form of extracts.

Essences and Colouring Matters for Confectionery.—A Bāngkōk manufacturer has sent to the Exhibition (Nos. 507, 547–9) numerous samples of fluid extracts from aromatic substances, etc., for use in confectionery, made by him from local drugs. His is a new industry, worthy of encouragement, especially as, thanks to it, it will become possible to utilize much of the innumerable aromatic and colouring produce of the exuberant Siamese flora, by preparing them into less bulky forms which will better pay export.

Statistical Data

Unfortunately there are no precise statistics available of Siam's exports with regard to drugs and spices, excepting the chief ones, and these only in so far as the Port of Bāngkōk is concerned. Data are therefore lacking for the exports from the ports on the Siamo-Malay Peninsula and P'hūket (Junk-ceylan) in particular, whence nutmegs, etc., are shipped, as well as regards the port of Chanthabūn, whence are exported coffee, pepper, etc., direct to Europe without passing through Bāngkōk. With regard to the drugs exported from Bāngkōk,

refers to the Wild Cinnamom (*Cinnamomum silvestre*) of North Siam, locally known as *samūn lawēng*, as distinct from the true Cinnamom of Ceylon (*Cinnamomum Zeilanicum*), termed *ob-c'hōi* in Siamese. The said Wild Cinnamom was often sent in the past by Siam as 'tribute' to China in substitution of cloves. Thence perhaps its epithet *lawēng*, presumably derived from *lawang*, the Malay term for cloves.

[1] See note 2, p. 167.

[2] Siamese turmeric is as regards to quality by no means inferior to that from Bengal.

the subjoined table will give an idea of the principal of them for the year 1909 :—

	Tons.	Value in Francs.
Cardamoms, best (*Amomum xanthioides* and *A. galanga*) [1]	10·57	98,698
Cardamoms, bastard or hairy (*Amomum villosum*)	136·46	232,380
Pepper [2]	1,349·21	1,358,502
Tamarinds [2]	148·86	25,158

G. E. Gerini.

[1] 1909 was an exceptionally poor year for this commodity ; on the other hand, during the preceding year nearly twice as much pepper was exported, up to a value of 208,090 francs.

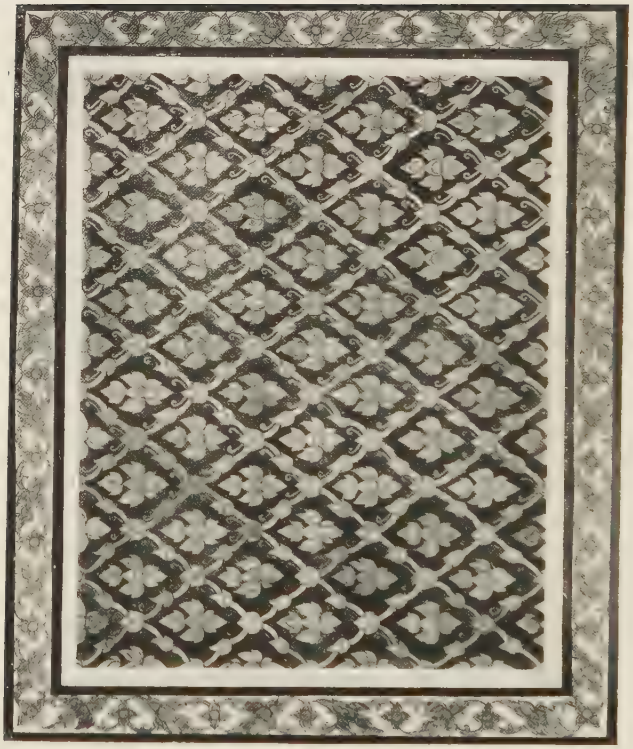
[2] Likewise a poor year in comparison with the three preceding ones (1906-8).

GROUP XVII

Food Industries and Products

Serial No.	Exhibitor.	Description of Exhibits.
	Class 98. Farinaceous Articles	
516–18	Royal Custom Department	No. 1 white rice (i.e. consisting of the largest grains).
519	,, ,,	White meal.
520	,, ,,	No. 2 white rice (i.e. consisting of medium-size grains).
521	,, ,,	Rough milled rice.
522–3	,, ,,	No. 1 white broken rice (i.e. comprising the largest fragments resulting from milling).
524	,, ,,	Parboiled rice (for the Indian market).
525	,, ,,	Sago meal rice (for food).
526	,, ,,	Garden meal rice.
527	,, ,,	No. 2 broken rice (i.e. embracing medium-size fragments).
528	Xavier, L., Bāngkōk	Granulated brewery rice.
529	,, ,,	Garden white table rice (the best for food).
	Class 100. Confectionery	
530	Royal Custom Department	Best cardamoms (*Amomum galanga*).
531	,, ,,	Second quality cardamoms (*Amomum galanga*).

Serial No.	Exhibitor.	Description of Exhibits.
532 3	Royal Custom Department	Bastard cardamoms (*Amomum villosum*).
534	P'hūket, Province of	Nutmegs from Junkceylan.
535	East Asiatic Co., Ltd.	Chanthabūn peppers.
536	.. ..	.. coffee (raw).
537	Oriental Store, Bāngkōk	.. ,, (roasted).
538	.. ..	,, ,, (ground).
539	.. ..	Javanese coffee (roasted).
540	.. ..	,, ,, (ground).
541	.. ..	Mixed Javanese and Chanthabūn coffee (roasted).
542	.. ..	Mixed Javanese and Chanthabūn coffee (ground).
543	Royal Agricultural College	Bastard cardamoms (*Amomum villosum*).
544	.. ..	Chanthabūn coffee (raw).
545	.. ..	.. black pepper.
546	.. ..	,, white ,,
547 8	Swee Ho, H., Bāngkōk	Essences and aromatic extracts for aerated waters and confectionery.
549	.. ..	Fluid colouring extracts for confectionery.



Siamese panel (exhibit No. 127 of the present Show).

GROUP XVIII

Extractive and Chemical Industries

CLASS 106

Products from Mines, etc.

Retrospective Remarks

Of the many mines of Siam, those of tin and argentiferous galena on the west coast of the Siamo-Malay Peninsula and in Junkceylan Island were famed since the most remote antiquity, and there is reason to believe they were already known to Phœnician navigators. The same may be said of the gold-mines lying within the same region of the *Aurea Chersonesus*, whence, from the time of Solomon—as may be inferred from the remains of ancient workings on a system altogether unique in mining history[1]—the precious metal appears to have been extracted. Marco Polo towards the close of the thirteenth century refers to gold being produced at *Locat* or *Loncat*, which the writer of these notes has demonstrated to be Nochi or Nōng-chik, on the east coast of the same peninsula.[2] Other gold-mines existed in the North of Siam, the produce of which was worked by local smiths, and a part also bartered for silver imported from South China, the latter being converted into ornaments or coined money.

Silver has always been one of the scarcest metals in Siam. Although present in sparse quantities in the galena referred to

[1] See for more particulars my recent work, *Researches on Ptolemy's Geography of Eastern Asia*, London, 1909, pp. 477-8.

[2] Cf. op. cit., pp. 497 and 815.

above, and in mines which are said to have once existed near Wīeng Chan in the East Lāu Country and near Nān in West Lāos, its supply has proved inadequate to the demand, so that it has invariably formed an article of importation. The silver out of which modern Siamese flat coins have been made has been for the most part derived from the re-melting of Mexican dollars imported for the purpose into the country from the middle of the last century downwards. This was but the continuation of a time-honoured practice, for Kæmpfer, who visited Ayuddhyā, the old capital of Siam, in 1690, relates that 'all the silver money of Siam was coined from Dutch crowns . . . imported by the Dutch East India Company'. Before this period silver plate was imported for the same purpose by the local English factors from Japan.

Iron is, on the contrary, fairly abundant in the country and is of an excellent quality. Famous, among others, were the iron-mines in the Lom, Lōi (at P'hū Lek), Hōt, Tāk, P'hichitr, Kamp'hēng P'het, and C'haiyā districts, the produce of which was turned into swords and cutlasses which were much prized.[1] The missionaries and travellers who visited Siam at the time of King Louis XIV of France talked a good deal of a magnetic iron mine situated to the north-east of C'hainātth.[2] Well known in that neighbourhood is the Thā Sūng mine, yielding a fairly rich iron carbonate.

[1] Other mines of high repute are those at P'hnom Sārakhām, east of Pet-ríu, and at Nam Phī, not far to the north-west of Lōi, between Nān and Pāk-lai. The Report on the Trade of Siam, 1678, refers to iron-mines in the north of the country, about Sukhôthai and Bisṇulōk (see Anderson's *English Intercourse with Siam*, p. 424).

La Loubère, who visited Siam in 1687, mentions the mines and famous steel of Kamp'hēng P'het, out of which excellent swords, daggers, and knives were locally forged.

Leal, who travelled along the west coast of the Gulf of Siam in 1825, refers to the celebrated steel from P'hūn-p'hin (near Bān Dōn), of which swords for the Siamese Court dignitaries were then made.

P'hichitr sword-blades enjoyed in the past centuries among the Siamese a similar reputation, for their superior make, to those from Toledo among us. Swords of an extremely elastic steel, obtained by smelting together three kinds of ore by means of three sorts of charcoal, were made at the time of Ayuddhyā and highly prized, being termed *dāb lek-pen*, 'animated steel swords,' because they could be worn round the waist as a girdle if desired, so flexible were they, and used in fighting, when they would be perfectly straight.

[2] This mine was visited by the Jesuit missionary Bouvet in January, 1687. Each villager had to pay one picul of iron to Government as royalty.

Copper is somewhat scarce. Although noticed in several places in Central and Eastern Siam, it has never been possible to extract it on a large scale. An Englishman started in 1856 to work some copper-mines near Lop'hburī, at the cost of his life. A Danish Company commenced operations in 1890 at the well-known Chanthŭk copper-mine in the west of the Khŏrāt Province, but had to give up the undertaking after a few years owing to unsatisfactory results. Lack of coal and scarcity of labour are the principal difficulties which handicap the mining of both copper and iron in Siam.[1]

But even gold-mines have scored no better success. The celebrated one at Bāng Tap'hān, discovered in or about 1740 and extensively worked for several decades, at first on behalf of Government and next by individual miners on their own account, when taken in hand over and over again by European parties and Companies during the second half of last century, proved a bad speculation. Thus also the other well-known and fairly rich gold-mine at Kabin, which, worked on behalf of Government from 1869 to 1883 with some success, turned out a failure later on when taken over by a European Company. The same might be said of the neighbouring Waḍḍhanā mine, which under foreign management and capital met with no better fate. Other gold-mines, situate in the Siamo-Malay Peninsula, also proved unsuccessful ventures when handled by European Companies, owing to the heavy expenditure entailed, while being notoriously remunerative to the natives of the country, who worked at them with their own simple methods, economy, and endurance of the climate.[2]

[1] Abbé de Choisi, who was in Siam in 1685, mentions 'une qualité de cuivre qu'on trouve dans les montagnes de Siam . . . ce cuivre est huit fois plus fin que le cuivre ordinaire, est fort rare, et donne à l'or un éclat brillant'. Accordingly it was employed to make what he terms *tambac*, that is to say, red gold, in Siamese *nāk* (see below, note prefaced to Group XXI, Class 135). This excellent kind of copper came probably from the mines near Lop'hburī (probably at P'hraḥ Bāt), which, according to Crawfurd (*Embassy to the Kingdom of Siam*, vol. ii, p. 171), were attempted to be worked by the French in the time of Louis XIV, and lately (that is, before 1822) to a small extent by the Chinese.

[2] Alluvial gold has also been worked in the past at Khlŏng Pang-rat Creek, on the western boundary of Chanthabūn (adjoining the Pasë District). In 1618

Zinc and antimony have been more or less worked in the province of Rājburī; lead at Pāk P'hrĕk (Kāñburī); argentiferous galena in the Sup'haṇ district and at Jala (or Jalor) on the Siamo-Malay Peninsula; wolfram on Samui Island.

Coal-seams (mostly lignite) exist in various districts, the most important being those in Bān Dōn, in Krabī or Ghirbi, etc., on the said peninsula. So far they have not yielded encouraging results to European enterprise, but it is not unlikely that with wise and shrewd management they may have a better future before them.

The same remark applies to the gem-mines which are worked with success by the natives in the province of Chanthabūn. Here and in the neighbouring districts have been obtained, from time immemorial, sapphires at P'hairin; rubies, spinels, garnets, and agates at Bān Yāt, Nā Wong, and elsewhere.[1] Some of

George Ball reported that 'Siam yielded gold which might be bought with great profit' (Anderson, op. cit., p. 70). In 1687, according to Tachard (*Second Voyage de Siam*, p. 227), the King of Siam had work done in gold and silver mines. In 1770 Turpin refers (*Histoire . . . du Royaume de Siam*, t. ii, p. 208) to an alluvial gold-mine then just discovered near a village called *Chandom* (?), and to another rich one but reopened (Bāng Tap'hān ?). In 1824 Captain Low wrote of the Bāng Tap'hān mines: 'It is not believed that these mines yield annually more gold than would be valued at perhaps about 15,000 rupees' (JRAS., 1836, p. 316). In 1822 Crawfurd observed (op. cit.) that 'the Bangtapan gold is said to be 19 carats fine'. In this he was mistaken, for it is, on the contrary, held to be 24 carats.

The Tomoh and other gold-mines in Legeh or Rangë, on the east coast of the Siamo-Malay Peninsula, have been worked since remote times, and from them came the large supplies of gold which Marco Polo in c. 1292 noticed in *Locac* or *Loncac* (the neighbouring Nōng Chik District). They are still being worked at present by Siamese and Chinese, though apparently with no very striking results.

[1] That rubies and garnets were already being dug in the Krāt district at the beginning of the fifteenth century is evidenced by the following passage in Ma Huan's account of the kingdom of Siam (*Hsing-ch'a Shêng-lan*, 1408 (see Journal China Branch R.A.S., vol. xxi, p. 37, 1887): 'A hundred *li* [some 20 miles] to the S.W. of this Kingdom there is a trading place called 上水, *Shang-shuei*, *Shang-shui* [either *Bang Plasoi* or *Sch'i Song-sun*, the ancient name of the neighbouring *Pĕt-riu* district], which is on the road to 雲後門, *Yün-hou-mên*, *Wên-hau-mun* [evidently *Pāk-nam Hūa Wĕn*, the mouth of the stream called *Khlong Hūa Wĕn*, on the E. coast of the gulf between Chanthabūn and Krāt]. In this place there are five or six hundred foreign families, who sell all kinds of foreign goods; many 紅馬厮肯的, *Hung-ma-sz-k'ên-ti* [= *Maṇiskandha* ?] stones are sold there. This stone is an inferior kind of ruby, bright and clear like the seeds of the pomegranate. The

these are cut by local lapidaries for use in the country, and the balance forwarded to Calcutta or to Europe by the local buying agents of private and public companies. Cornelians and gems of smaller value are found in several other places, among which are the Nān district and the banks of the Mūn River in the east of Khôrāt.

Pearls occur at Junkceylan,[1] and, in general, on the coast of the other Siamese islands lying within the neighbourhood of the Mergui Archipelago; but diamonds, although often spoken of, have never as yet been found in Siam.[2]

Saltpetre, locally employed for centuries in the manufacture of gunpowder and fireworks (an art in which the Siamese have always achieved no small distinction), is mostly derived from the deposits of guano accumulated by myriads of bats in the many caves of limestone formation which exist in the country (especially all over the Siamo-Malay Peninsula and Southern Siam).[3]

In conclusion, the main mineral product of Siam is tin, of which she owns on the west coast of the Malay Peninsula and in Junkceylan Island some alluvial beds ranking among the very richest of the world.[4] Gold, gems, and other valuable

captains of Chinese vessels resorting to Siam also use small boats to go and trade there.'

Rubies and other precious stones from Siam and Lāos (*C'hieng Mai*) are referred to later on in William Eaton's (1617) and George Ball's (1618) reports (see Anderson, op. cit., pp. 69-70).

[1] So Capt. Low in JRAS., 1836, p. 49.

[2] Turpin (op. cit., i, 218) says that a diamond-mine had been discovered in the north of Siam about 1700, but since forgotten. The reason was evidently that no true diamonds were to be found there.

[3] Ligore and P'hattalung; Saraburī and Lop'hburī districts.

[4] These tin-fields have undoubtedly been known since the remotest period, whereas some of those on the east coast of the peninsula appear to have come into notice much later. Tavernier (cf. Ball's trans., vol. ii, p. 162, London, 1889) states: 'Some years ago [i.e. in *c.* 1640] very rich tin-mines were discovered at *Delegore* [Ligor], *Sangore* [Singora], *Bordelon* [P'hattalung], and *Batt* [*Bardia*, i.e. either C'hump'hōn or Pathíu, further north].'

On November 6, 1675, patents were granted by the P'hrah Khlang (Minister for Foreign Affairs) of Siam to the Hon. East India Company, with exclusive rights to buy tin in C'hump'hōn, C'hayā, Thā Thōng (now officially known as Kāñchanadit), and P'hūn-p'hin. The Dutch, at the same period, bought tin at Ligore.

In 1658, according to the Siamese annals, tin-mines had been discovered and were being worked in the Śrī Śvasti district (to the north of Kāñburī and west of Sup'haṇ).

minerals are not lacking, but, owing to climatic drawbacks and dearth of labour, seldom prove remunerative to European enterprise, while often yielding handsome returns if worked by natives on their own account.

Of special importance among the quarries are those of steatite in the provinces of Rājburī and Kāñburī.[1] This stone is cut into small round sticks which serve as pencils to write on the folding books of black paper still employed to a large extent in the country. A large trade is also done in softer pencils manufactured with a white chalk dug in the Lop'hburī Province. Here sulphurets of arsenic and mercury also occur. A sort of hone, varying in colour from black to white, is taken from the Kui district on the west coast of the gulf; granite and marble quarries are worked in several places; salt is extracted in considerable quantities from sea-water on the coast, and in some small measure from salt wells in North Siam[2]; stone lime is obtained from quarries in Rājburī, and common lime from burnt shells, as already said. Hot springs occur on and near both coasts of the upper part of the gulf, but seem to be of but small therapeutic value.[3]

In order to ensure a more efficient control over mines and mining in Siam, and to further promote at the same time the development of this industry on rational lines, a Royal Department of Mines and Geology was instituted in 1890. Special rules and regulations for the grant of prospecting licences and mining leases have since been from time to time issued, the latest of which is the Siam Mining Act of 1901, now in force over the greater part of the country. Thanks to this Act it is nowadays a quite easy matter to obtain prospecting licences and mining leases after it can be shown that the preliminary mining work has yielded satisfactory results.

Samples of the chief minerals which actually form the object of industrial undertakings in Siam figure in the present Show, and will serve to give a fair idea of the country's varied mineral resources, in some cases of considerable importance.

[1] Steatite also occurs in the Śrī Dharmarāj (Ligore) Province.

[2] At Bān Bō, to the west of Dān Sāi, etc.

[3] One occurs at Bāng P'hraḥ, on the east coast, and several others inland from P'hejburī on the west coast, and elsewhere in Western Siam.

One may notice, among such specimens, ores of tin coming both from alluvial fields and lodes; of wolfram[1] and copper; and, moreover, gold-bearing quartz, argentiferous galena, and saltpetre. Among gems are shown sapphires (for which Siam is especially famed and is one of the chief sources of supply of the world), rubies, and spinels, all raw and uncut. This small collection is completed by a series of photographic pictures of mining works and processes in Siam. Some of these represent the gigantic dredgers working in the Bay of P'hūket on behalf of a British Company, with a view to digging tin-ore from the bottom of the sea there. This should not come as a surprise, for the whole of that island and neighbouring coast is fully impregnated, so to speak, with tin, of which it forms but a single vast mine. Exceedingly rich alluvial beds of this mineral occur in the plains, in the bottom of the sea, and even under the inhabited centres, so that indeed most part of old P'hūket town had to be pulled down in order to utilize the wealthy deposits of tin-ore over which, as it was later discovered, it had originally been built. The most recent tin-mining lease granted includes just the area occupied at present by the Provincial Government Offices, which are built on extremely rich tin-bearing strata, a true Eldorado for investors.

Statistical Notes

The total output of tin in the Province of P'hūket for 1908 amounted to 3,879 tons, while that derived from other districts on the same coast barely reached 97 tons. It is not improbable that such an output may be doubled within a few years, thanks to the enterprise of two important mining companies which have recently been formed in Siam for the working of the tin-fields above referred to. See, in fact, in the note following below the returns for 1909.

The east coast of the Siamo-Malay Peninsula is not so rich

[1] Wolfram is being successfully worked by a British Company on Samúi Island (Koh Samúi), near the west coast of the Gulf of Siam. This metal is nowadays largely employed in the manufacture of steel for mechanical tools requiring high speed, in the composition of which it enters at the ratio from 10 to 20 per cent. Hence its constant demand in the Western markets.

in tin as the western. The chief mines at work on the former are in the Provinces of Ligore and Patāni. In the latter especially worthy of note are those of the Jala district, where extensive lodes of argentiferous galena also occur. In 1908 the following quantities of tin were exported from the said provinces :—

	Tons.
1. From Ligore (officially, Nagara Śrī Dharmarāja)	148·18
2. From Patāni (coming from Jala) . . .	271·44

The tables and customs returns concerning exports from the Port of Bāngkōk obviously show only that irrelevant quantity of tin which, coming down from Central Siam, is shipped outwards from that port. On the other hand, the output of the richest Siamese tin-mines in the Siamo-Malay Peninsula and in the Island of Junkceylan is directly exported from the seaports of that region to either Penang or Singapore, whence it is re-shipped to all parts of the world. For similar reasons the gem production of the districts on the east coast of the Gulf of Siam figures but slightly among Bāngkōk exports. The data available in this respect for the latter port in 1909 are the following :—

	Tons.	Value in Francs.
Tin Oxide[1]	16·82	16,370
Gems.		
Rubies, rough (entered by value only)		33,342
Sapphires, rough ,, ,,		2,342

G. E. Gerini.

Note on Mining in Siam

Mining in Siam is, at the present time, practically confined to tin and gems (rubies and sapphires), although several other minerals exist and are worked on a small scale by primitive methods.

Tin is the only metal of importance now exploited. The centre of the industry lies in the Island of Puket and the surrounding Siamo-Malayan districts on the west coast. The

[1] This comes from several mines in the valley of the Nam Sak, a left tributary of the Me Nam Chāu P'hyā or Bāngkōk River.

mineral also occurs widely distributed over the east coast provinces, from which the output may be expected to increase.

The tin exports for the year ending April, 1910, were 5,200 *short* tons of tin metal, the contents of the exported ore being estimated and included in this total. This quantity, representing some 5 per cent of the world's output, was valued approximately at £646,800.

Wolfram is found throughout the Siamo-Malay Peninsula, small workings occurring on both coasts. A European Company has a concession in an island in the Gulf of Siam. The output to date is over 25 tons valued at £1,500.

Lead veins of argentiferous galena are reported to have been found in the Siamo-Malayan district of Jalah and other places on the east coast. Several applications for permission to work these have been received by the Government.

Gold and *Iron*, though worked in the past, are now only mined on a very small scale.

Gems in the form of rubies are found in Chantabun and Kratt, but the greater part of the sapphires are obtained from Battambong, lately ceded to France. No control of these mines being exercised, statistics are not available. The output is reported to be very small.

Petroleum is obtained in small quantities by the skimming of shallow pits dug for the purpose in the north of Siam.

THE R. DEPARTMENT OF MINES AND GEOLOGY.

CLASS 110

Ceramic Industries

General Remarks

Siam is represented in this section almost exclusively by her domestic earthenware, jars, pots, etc., all products of an industry likewise appreciated abroad and which has always had a considerable development, because it supplies not only the local demand but also that from the neighbouring States.

In a paper published elsewhere the writer has demonstrated

that most of the famous vases known some centuries ago under the name of 'Martabani' came from Siam either directly or via Martaban, to which seaport they were conveyed by land.[1] Above in this Catalogue reference has been made to the much prized Sām-khôk jars (p. 38) and to the fine polychromic figured ceramics or pseudo-porcelains, formerly manufactured at Sawankhalôk (p. 80), of which latter some fine specimens are also exhibited in this Show. Unfortunately this industry, so flourishing of old, even in other parts of Siam, viz. at Sukhôthai, Ayuddhyā, etc., declined, owing to the devastations wrought in the country by the Burmese, which culminated in the downfall of the capital Ayuddhyā in 1767. The few specimens still extant of such wares fetch very high prices, whence it follows that the local market is now being overflowed with imitations perpetrated in China, which are often foisted upon inexperienced people as genuine by unscrupulous dealers, who are realizing large profits therefrom.

Much appreciated also are the water goglets of a blackish porous clay coming from the Lāu districts of Northern Siam, which possess the property of keeping water cool. The same reputation was likewise enjoyed, among European travellers and traders of the seventeenth and eighteenth centuries, by the Patāni earthenware.[2]

Besides samples of the domestic earthenware noticed above, there figure also in the present Exhibition some of the peculiar tools employed by the native potter, for instance a wooden polisher for smoothing the pieces while they revolve on the lathe and eventually imprinting on them various ornaments; and a pair of terra-cotta balls such as are used to shape and press the pieces internally, while the polishing stick is being applied to them on the outside.

A more detailed description of Siamese earthenware and of the local primitive methods of its manufacture will be found in

[1] See my articles on 'Siam's Intercourse with China' in the *Asiatic Quarterly Review* for January and April, 1902.

[2] See op. cit. Sixteen pieces of Patāni earthenware figured among the presents sent by the Prime Minister Constance Phaulcon to the King of France in 1685. They are described in Chaumont's *Relation* as 'seize pièces de différentes sortes de terre de Patane au-dessus de *Mingal* [?], pour cuire l'eau'.

the technical note which follows. Here it will suffice to add some statistical data on its export. There were exported from Bāngkōk, in 1909, 60,560 earthen pots of various size and shape, to the value of 11,730 francs, a rather small amount if compared with that of the preceding year. In 1905 the pots exported were 79,000 with a value of 13,050 francs. Besides this sort of earthenware a large quantity of jars is sent abroad full of preserves, oils, and resins of different kinds. From these particulars one may judge how considerable is the production of earthenware in Siam, if the fact be taken into account that this industry entirely meets local requirements.

Crockery and pseudo-porcelain, which formerly were for the most part manufactured in the country, are now imported from China; while the finer ceramics come thither, not only from China and Japan, but also from Europe.

G. E. Gerini.

Note on Domestic Earthenware Manufacture in Siam

(Translated from the original Siamese)

The earthenware manufactured in Siam chiefly includes articles for domestic use, viz. pots, jars, and basins of various size and shape.

The fictile clay for the factories situated in the south of Siam is procured from Bāng Búa-thōng in the Nonthaburī district: it is a blackish tenacious clay which is mixed and kneaded with a third of fine sand, being for this purpose trampled by buffaloes on a threshing-floor.

The main centres of the pot manufacture are Bān Mō and Bāng Lamp'hū Bon at Bāngkōk; Bāng Tanawaśrī in the Nonthaburī district; and Bān Srab Búa in Ayuddhyā. The jar and basin industry centres, on the other hand, at Pāk Kret in Nonthaburī and at Sām Khôk, now officially known as Prathum-thānī.

The principal implements for this craft are: the lathe (*c'hō* or *pën*), consisting of a wheel, put in motion by an assistant, which revolves on a pivot fixed vertically in the ground; a wooden polisher or moulding stick (*mai lāt*); an earthenware

ball (*lūk hín*) wherewith to shape and round the inside of the piece; a pointed bamboo stick (*mai tat p'him*) and a scraper (*khrŭang khūt*), consisting of the valve of a shell with a sharp cutting edge.

The kiln in which the earthenware articles are baked is a rectangular masonry enclosure (of bricks and mortar), measuring 4 by 3 metres, 3 m. high, and half a metre thick, capable of containing some 1,800 or more pots, with their lids. The fuel employed is *thōng-láng* wood (*Erythrina* sp.), which possesses the advantage of burning slowly, thus ensuring a constant moderate heat, and *samë* wood (*Avicennia* sp.). For one baking are required on the average sixty large pieces of the former and 1,700 of the latter kind of firewood. During the dry season as many as ten bakings a month can be effected, but in the rainy season only from four to eight.

The kiln (*tau*) employed for baking the jars, pots, and basins is a larger rectangle, viz. 10 by 3½ m. and 3¾ m. high, capable of containing from 4,500 to 4,600 pieces of various sizes. The baking lasts about a fortnight, and requires about 12,000 pieces of *tā-tum* wood 2·5 m. in length and 0·12–0·15 m. in diameter, which cost from thirty to forty francs per thousand.

The principal sorts of earthenware turned out by the industry above referred to are as follows:—

Pots.—1. *Kradī*, a large steamer without lid, fluted on the outside, employed for cooking soups, vegetables, etc.

2. *Thanon*, smaller than the preceding one, but higher and thicker, also without lid and fluted on the outside, with a wide mouth. It is not used for cooking, but only as a receptacle for various foodstuffs, generally raw palm-sugar (termed therefore 'pot sugar', in Siamese *nam-tān mō*).

3. Three *thanān* (or cocoanut shell) pot,[1] which is of two kinds, one without external ornaments, called 'rice pot' (in

[1] The *thanan*, vulgo *khanan*, is a Siamese measure of capacity, consisting of half a cocoanut shell of average size. The standard or legal *thanan* is supposed capable of holding 830 tamarind seeds, and corresponds in our measure to about nineteen-twentieths of a litre. Twenty *thanān* make a *thāng* or bucket (of about 19 litres' contents) used for measuring white rice, as well as other articles, including liquids. Twenty-five *thanān* make a *sat* or bushel (about 25¾ litres) exclusively employed to measure paddy. (G. E. G.)]

Siamese *mō khāu*), and chiefly employed for cooking rice; and the other ornamented externally and therefore of greater thickness, called 'sauce pot' (in Siamese *mō kĕng*), used as a stewing-pan to cook curries or sauces intended to be mixed as a condiment with boiled rice.

4. Two *thanān* pot
5. One *thanān* pot
6. Small pot (*mō nā*)
7. *Krachib* pot

} Of gradually decreasing size, and used for the cooking of both rice and curries.

The classification adopted for the pots referred to above, of one, two, and three *thanān* measures, does not refer to the volume of uncooked rice they are capable of holding, but to the bulk which rice acquires after having been cooked in them. The size of each pot is therefore so calculated that, when putting in it to cook one, two, or three rice measures (*thanān*), it can easily hold the same in the state of turgidity which rice acquires by cooking.[1] All three sizes of the said rice pots

[1] The cooking of rice in Siam is performed in a special manner, which somewhat resembles that used in preparing the Milanese *risotto*. It is effected partly by boiling and partly by steaming. It, however, requires no little skill and experience, in view especially of the scanty amount of water employed.

The process is as follows. Once the rice has been put in the pot, cold water is poured on it, with which it is washed in the pot itself; then the water is drained off and a new supply put in, just enough to cover the rice; the pot is afterwards set upon the fire. As soon as it comes to the boil the contents are skimmed and stirred. After boiling a few minutes longer, until the grains swell and begin to burst, all the water is drained off and the pot set near the fire to steam in order to complete the cooking. In this manner the rice will swell up to its full, and when removed from the fire it is almost dry with its grains intact (and not at all adherent to one another) and possesses a delicate flavour.

Part of it, however, that is to say, that which has remained in contact with the inner surface of the pot, sticks thereto during the second period of the cooking, forming a baked crust. This is detached and partaken of as a relish like toast among us.

From the pot the rice, so cooked, is served out in bowls to the guests. In the centre of the table is placed a tray (the curry, or *sambal*, tray) containing a number of small cups and saucers replete with different sauces and ragouts (meat, fish, vermicelli, vegetables, etc.) with a varied assortment of delicacies, like our *hors d'œuvres*; minced vegetables, smoked and salted fish, boiled turtle eggs, salted duck eggs in slices, tamarind pulp and fruit jams, sweetmeats, etc. This tray represents the central pantry, from which every individual guest can help himself to whatever he chooses in the line of eatables and condiments, which he now and then mixes, together with the rice, in his own bowl before partaking of it. Once this service, during which plain water

are presented under Nos. 586-9 and the curry pots under Nos. 590 2.

Jars, Basins, etc.—Those mostly used are the following:—

1. *Ông* or jars, of which there are three sizes—large, middle, and small. The largest are generally 70 cm. high and 60 cm. in diameter at their broadest part, decreasing to 26 cm. at their mouth. They are chiefly used for keeping water, while the smallest are especially employed as receptacles for preserves, salt fish, and other provisions. The price current is 400 francs per 100 for the large, 300 for the middle, and 24 for the small ones. No. 594 is a sample of the smallest-sized jars.

2. *Âng* or basins, which are also made of three different sizes. The largest are 20-25 cm. high, and have a diameter of 50 cm. at their upper rim and 25 cm. at bottom (see No. 598). They are used to hold vegetables and to rinse different articles in. The middle-sized ones serve a similar purpose; but the smallest are employed as lids for jars, on the top of which they are placed as they stand, i.e. with their concavity facing upwards and not turned upside down. The price current for each hundred pieces is 100 francs for the large, 40 for the middle, and 42 for the smallest.

3. *Hài*, amphors or little jars. They are usually made of a uniform size, somewhat smaller than the smallest jars, and are serviceable in storing salt, drugs, etc. The price is 12 francs per hundred. A sample of them is shown at No. 593.

The Royal Agricultural College.

CLASS 115

Distillation of Wood, etc.

Two samples of wood-oil, bearing Nos. 600 and 601, are shown in this class.

is drunk, is over, a course of cakes and sweetmeats, with boiling tea, is brought in. This completes the rather sober meal, which is unfailingly followed by a perfumed cigarette of local make and by the aromatic, though acrid, betel quid. (G. E. G.)]

CLASS 118

Industry and Technology of Fats, Soaps, etc.

The soap industry has long been in existence in Siam,[1] but up to a few years ago it was restricted almost entirely to the production of common washing soap. This was made with potash locally extracted,[2] of which a sample is exhibited under No. 602, and cocoanut, tilseed, or some similar oil.

Nowadays, however, common as well as fine soaps are being manufactured after more rational methods, as may be judged from the specimens of yellow, mottled, toilet, and medicinal soaps displayed at this Exhibition by the Siam Industries Syndicate, which for such produce was awarded a gold medal at the first annual Exhibition of Agriculture and Commerce held in Bāngkōk in April, 1910.

CLASS 119

Colouring Stuffs

The dye stuffs traditionally employed for textiles in Siam are all of vegetable origin, being derived either from woods, barks, roots, or from resins, as, for instance, lac, which is, however, due to the puncture of a small hemipterous insect (the *Tachardia lacca*)[3] on the trunk and branches of certain

[1] Apparently only after the arrival of the Portuguese into the country, if we are to judge from the term *sabū*, the Siamese name for soap, which seems to be derived from the Portuguese *sabão*. Cf., however, French *savon*, and the Arabic, Gujarāti, Hindi, and Malayalim *sabun*, the origin of which might be traced, whether directly or not, to Latin *sapo*.

[2] From the ashes of certain plants, among which the banana, the palmyra or *borassus* palm, the thorny amaranth (*Amaranthus spinosus*), etc.

[3] See the enlarged drawing of this insect exhibited under No. 350 in this Show by the Royal Agricultural College. Its culture is extensively carried on in the eastern and northern provinces of Siam. The season begins in February and lasts till September or October. The yield from one tree amounts to 300 or 400 grammes, and it is sold on the spot at 0·6 to 1 franc per kilo, according to quality. See the data on the export of this produce at p. 122, and the various samples of it exhibited under Nos. 349, 362-3, 368, and 379-82. This resin is

forest trees (*Shorea robusta*, *Schleichera trijuga*, *Butea frondosa*, etc.). As a good many of these colouring substances are of considerable usefulness and importance, while some others are yet but little known among us, it will not be uninteresting to give here a brief notice of them, adding also, whenever it seems expedient, some explanations on the purposes to which they are applied and on the mode of their employment.

Red Dyes.—1. *Khràng* or lac, used for dyeing a crimson red.[1] The textiles so treated may be turned into a violet or purple colour by dipping them into a solution of indigo (No. 16). On the other hand, fabrics dyed blue in indigo become black if dipped into a lac solution (No. 23).

2. Roots of wild *yō* (*Morinda tinctoria*), for dyeing a fine deep red.

3. *Fāng* or sapan-wood (*Cæsalpinia sapan*), for dyeing a dark-red and also a violet colour.

4. *Kaṇṇikā* sepals (*Pterospermum acerifolium*), for dyeing an orange red.

5. Capsules and seeds of *sët* (*Rottlera tinctoria*), for dyeing a scarlet red.[2]

6. Flowers of *kham* or safflower (*Carthamus tinctorius*), to dye in rose. This is not, however, a fast colour and soon fades away.

the result of the exudation of the tree (consequent upon the punctures made on its bark by that insect), combined with the secretion from the body of the insect itself. It is sold generally in a raw state, but for export it is usually subjected to a preliminary rough cleansing, like that of which No. 363 of this Exhibition is a sample.

[1] For such a purpose the lac is first reduced to a fine powder, then boiled in water till it acquires almost a syrupy consistency and the colouring matter is entirely dissolved. After filtering, some tamarind pulp and lime-juice is added to the fluid, which is again strained through a cloth and warmed in a cauldron upon the fire. The yarn or fabric to be dyed is then first dipped into a solution of alum, wrung in order to squeeze out the excess of liquid, and finally transferred to the warm lac solution. The process is repeated several times till the desired shade has been attained. The yarn or fabric is then well rinsed in water and hung out in a shady place to dry.

[2] The seeds are put into a cloth and soaked in hot water, being repeatedly squeezed the while in order to quicken the solution of the colouring matter contained therein. The liquid thus obtained is largely employed to dye the *p'hā hòm*, or coloured scarves worn by the Siamese belles across their shoulders or wrapped round their waists.

7. Corollæ of *kham fōi* or arnotto (*Bixa orellana*), to dye a pink colour.[1]

8. Flowers and bark of *lōt* (*Simplocos racemosa*), to dye either red or yellow.

YELLOW DYES.—9. Berries of *p'lut* (*Gardenia grandiflora*).

10. Heart-wood of *knanún* or jack-tree (*Artocarpus integrifolia*), termed also *krak* or *krak-khī* by the Siamese and krachi-wood by Europeans.[2]

11. Rhizomes of *khamín* or turmeric (*Curcuma longa*), which do not, however, yield a fast dye.[3]

12. *Rong* or gamboge (yellow resin of *Garcinia Hanburyi*). This is, however, not employed as a dye, but only as a paint and for the preparation of the golden-yellow ink such as is used for writing on the folding blank books of local black paper.[4]

[1] The corollæ of these flowers are soaked in water, to which a small quantity of lime-juice is afterwards added. The yarn or cloth to be dyed is then dipped in this infusion, rinsed in water, and hung out to dry. After several successive soakings a beautiful pink colour is obtained.

[2] Widely employed to dye both cotton and silk, as well as the yellow robes of Buddhist monks. The process is as follows: The wood having been finely chopped is boiled in water till all the colouring matter is dissolved. After filtering through a cloth a sufficient quantity of water is added, and the liquid brought up almost to boiling-point, when it is removed from the fire. The yarn or textiles to be dyed are first well soaked in a solution of alum, wrung, and then dipped into the warm dye. A deep yellow will be obtained by using a quantity of wood four times as much as the weight of the fabrics; with only half such a weight of dye wood the result will be a pale or straw yellow.

[3] One part of pulverized turmeric is mixed with 0·7 part of lime-juice and four parts of water. The infusion is then filtered, and only as much of it taken as suffices for the textile, which is dipped therein after having been rinsed in water and thoroughly wrung. Several successive soakings into as many separate portions of the dye are necessary in order to attain a sufficiently bright colour.

The powdered rhizomes of turmeric are also widely employed for smearing the bodies of children after bathing, thus imparting to them the traditional golden colour so prized in India and neighbouring countries. An unguent for the skin is also prepared out of the rhizomes, which prevents the swelling consequent upon mosquito bites.

[4] The bark of the tree nevertheless finds employment as a light-yellow dye. The resin, on the contrary, when dissolved in turpentine, forms a beautiful and permanent varnish for metallic surfaces.

Gamboge occurs in the eastern provinces of Siam between 15° and 17° N. lat. It is obtained by gashing the trunk of the tree spirally as well as by breaking off its young shoots. The resin that flows therefrom is collected into joints of bamboo, where it gradually thickens and at length solidifies into cylindrical sticks. These are, however, hollow by effect of the violent contraction the resin undergoes during the drying. See No. 364 of this Exhibition for samples of such cylinders of gamboge.

13. Heart-wood of *kë-lë* (*Artocarpus* sp.), also employed for converting into green fabrics which have been previously dyed blue in indigo.[1]

14. Rind of the *matūm* (bale or vilva) fruit (*Ægle marmelos*).

15. Seed-pods and flowers of kanthalikā (*Nyctanthes arbor-tristis*).

Blue Dyes.—16. Stalks of *khrām* or indigo (several varieties of *Indigotiferæ*[2]). Also employed to dye black (see No. 22), and to transform into a violet or purple colour textiles which have previously been dyed red with lac (see No. 1).

Violet and Purple Dyes.—See No. 16.

Green Dyes.—See No. 13.

17. Wood of the *krahūt* tree.

Brown Dyes.—18. Bark of *sī-sīet* or cutch (*Nauclea Gambir*, *Acacia catechu*), etc.[3]

19. Bark of *samë* (*Avicennia officinalis*), utilized also to dye black (see No. 22); widely employed to dye fishing nets a chestnut-brown colour (see p. 129 above).

20. Berries of *map'hlab* (*Diospyros embryopteris* and *glutinosa*), used likewise to dye fishing nets brown (see p. 129 above).

[1] The heart-wood of the plant, which is a thorny climber, is finely chopped and boiled in seven and a half times its weight of water till this has been reduced to two-thirds by evaporation. The liquid thus obtained is then poured into a basin, adding to it a small quantity of alum. Yarn or cloth which has been previously dyed blue in indigo is dipped into the solution, the resulting colour being a light or dark green according to the intensity of the blue previously imparted to it.

Kë-lë wood is also employed in medicine, an extract from it being used as a blood tonic.

[2] Two hundred parts of pulverized indigo are put into a vat 3 feet in diameter and the same in depth. This is then filled with water into which ten parts of fermented rice (*khau mãk*) and twenty-eight parts of *samë* ash lye are dissolved. The liquid, after having been well stirred, is left undisturbed for twenty days. At the end of this period it is ready for use. Textiles which are to be dyed a light blue are steeped into this solution for two or three times in succession, and more if a deep blue is required.

[3] A sample of this bark, No. 344, is on view at this Exhibition. The dye is prepared by soaking the bruised bark in water till all the colouring matter is extracted therefrom. The solution is then boiled and sometimes concentrated, in which form the residue is allowed to concrete by exposure to the air. This is used sometimes as a balsam for wounds, but more generally chewed along with betel leaf as a substitute for the areca-nut, especially where the latter is difficult to procure (as, for instance, in the eastern and northern provinces of Siam).

Black Dyes.—21. Bark of *palong* or mangrove (*Rhizophora mangle*).[1]

22. Indigo mixed with *samë* bark (Nos. 15 and 19).

23. Dyeing in indigo and re-dyeing in lac (No. 1).

24. Leaves and berries of *maklüa* (*Diospyros mollis*).

Samples of the last, as well as two small bottles of extract prepared from them and a piece of silk dyed black with it, figure at this Exhibition under Nos. 604-4*b*. It is quite beyond doubt that the black dye obtained from such substances is far superior, both for beauty and durability, to any other known to us (*catechine*, *divi-divi*, babba pods, etc.). The difficulty, which has so far baffled our dyers, of imparting to the textiles a bright genuine jet-black, unmarred by any trace of blue or brown, and able to stand washing, is notorious; accordingly the dyes above referred to fully deserve the attention of our technical people. They serve to dye both silk and cotton. For such purpose the berries, when yet green, and the leaves are pounded and soaked in water. Then the textile to be dyed is steeped many times in succession into the liquid, until it acquires a deep-black colour. This result is attained in a comparatively short time if a bright sunshine favours the operations, especially while the fabric is exposed in the open air to dry after each soaking.

The Bāngkōk merchant, L. C. Teck, who exhibits the above-mentioned specimens of leaves, fruits, and extract, has drawn up the following directions when using his extract to dye fabrics in black: –

1. Take white cotton or muslin cloth and wash first in water, in order to remove the starch which might be found still adhering to it.

2. Mix a part of the extract with an equal quantity of water, dip the cloth into it, and soak properly for about ten minutes.

3. Remove the cloth and squeeze the liquid out; then expose it to dry in the sunshine.

[1] See Nos. 383 and 923-5 of this Exhibition for samples of this bark for dyeing and tanning purposes; and No. 605 for a specimen of leather tanned by means of this bark.

4. When the cloth is thoroughly dry, apply a second dye, and repeat the operation until the desired shade has been obtained.

With the simple dye stuffs referred to above and with many others which would take too long to mention, the Siamese have obtained for centuries those tints, so characteristic for beauty and brightness, which they blend and apply so tastefully to their scarves and skirts. Thus, on occasions of festivals and rejoicings attended by large crowds, such garments form a glowing kaleidoscope of numberless hues and shades, charming the eye and never to be forgotten by those who have had the opportunity to witness it.

Unfortunately, during the last twenty years or so, alizarine and aniline, with their derivate dyes, have also found their way to Siam. It can hardly be imagined how mischievous these productions of Western science prove to the tinctorial and textile industries of the Far East, of which they mar and pervert the most exquisite, the most intimate characteristics so cherished by all those who feel reverence for whatever is genuinely and supremely beautiful in the arts and artistic traditions of every people and country. Thus it comes to pass that in Siam, as in India and in almost the whole of the Far East, one witnesses the regrettable and still increasing diffusion, on account of their glaring colours and cheapness, of the novel and fascinating mineral dyes above mentioned, which, like Sirens of deceitful mien, slowly but surely entice the characteristic native textile art into the abyss of perdition. The reputation for durability, delicacy, and harmony of colour, which have so far characterized native fabrics and made them so prized by the whole world, will thus fall sacrificed to the fallacious glory of the novel gaudy ephemeral tints, which bring a discordant note of mountebank trombone and a fleeting glow of tinsel into the admirable symphony of the native feast of colours.

G. E. Gerini.

CLASS 122

Skins and Leather ; Tanning Substances ; Resins, Varnishes, Rubber, etc.

In this class are on view a sample of leather tanned with mangrove bark, of which mention has already been made above ; a specimen of black lacquer employed as a varnish, etc., in accordance with what has been related on p. 77 ; a sample of rubber and two of gutta-percha, which should prove interesting for their novelty, being of kinds almost or quite unknown.

One of the two samples of gutta-percha (No. 606) is derived from a gigantic tree botanically termed *Dyera costulata*, and locally designated by its Malay name of *getah jelutong* ; this tree grows in the Siamese districts of the Malay Peninsula.[1]

The specimen of rubber (No. 608) is yielded by a wild shrub known in Siamese as *katang-katiu*, and strongly resembles Pará rubber. Besides such varieties of rubber, several others not represented in this Exhibition are indigenous to Siam. During the last decade or so the cultivation on a larger scale of such rubber plants as have been found best suited to local conditions has been vigorously promoted in the country, and various industrial concerns have been floated in Bāngkōk with that end in view. Thus rubber cultivation has of late years fast developed, particularly in the provinces of P'hūket and Trang on the west coast of the Siamo-Malay Peninsula, so that numerous plantations of rubber-yielding trees, some of which are pretty extensive, already exist there which prosper well, favoured by exceptionally propitious conditions of climate and soil. It is, accordingly, very likely that such provinces are destined to attain in a near future the first place among the rubber-producing districts of Siam.

As regards gutta-percha, it has for years been the object of a flourishing trade in Patāni.

[1] Pallegoix already refers in his work, published in 1854 (*Description du Royaume Thai ou Siam*, t. i, p. 144, Paris, 1854), to gutta-percha having been discovered a few years prior to that on the coast of the Siamo-Malay Peninsula and in the maritime provinces of Siam. The price, he adds, was at first merely 27 francs per 100 kilos, but in 1854 it had already gone up to 170 francs.

CLASS 123

Industry of Perfumery: Pomatums and Oils, Toilet Waters, Scented Essences and Powders, etc.

It may easily be imagined that in an Eastern and tropical country like Siam the prime materials for perfumery must be most varied and of the rarest and most prized kinds, being moreover extensively used, especially by the fair sex.

The industry of perfumery has accordingly been practised in Siam from the earliest time on a vast scale—though limited as a rule to the supply of local requirements—which it did with primitive methods. It may be said that in every family the industrious housekeeper prepares with her own hands the scented waters, oils, powders, and cosmetics for domestic use. Anyone who cannot do it for want of leisure, or does not care to, may easily procure the required perfumeries from the local market and retail shops.

The products of this native industry are, as said above, scented waters, oils, powders, and cosmetics. Distilled essences are more rare. All are of vegetal origin, being derived from roots, barks, flowers, and gum-resins, bountifully yielded by the most exuberant local flora. It would carry us to too great lengths to enumerate them all here; let it suffice to briefly mention the chief preparations.

Toilet Waters.—These are termed *nam ôb* in Siamese, and used generally for rubbing and perfuming the body after bathing, together with turmeric (q.v.). They are infusions of flowers, sometimes of a single kind and sometimes of several sorts mixed together. The substances most widely employed are rose petals (to make rose-water); blossoms of *kadang-ngā* (*Kananga odorata*), the Siamese *ylang-ylang*; of *khém* or Siamese *ixora* (*Ixora pavetta*); of *lanthom* (*Plumiera acutifolia*), a very sweet-smelling jasmine; of *mali sōn* (*Jasminum grandiflorum*); of *champā* (*Michelia Champaca*), a species of magnolia; of mango; of *sāi-yut* (*Parinarium* sp.); of *p'hikūn* (*Mimusops Elengi*); bark of *chalūt*, a kind of wild ivy; benzoin or gum benjamin, etc.

Essential and Scented Oils.—The prime materials employed in their preparation are: flowers of *kanthalikā* (*Nyctanthes arbor-tristis*); of *lamchīek* (*Pandanus odoratissimus*), from which a product similar to rose oil is derived; of *kadang-ngā* (*Kananga odorata*); lemon grass (*Andropogon citratus*); citronella (*A. nardus*); ginger grass or *takhrai* (*A. schœnanthus*); *wānn c'hamot*, a sweet-smelling variety of *kæmpfera*; roots of *khā* or galanga (*Alpinia galanga*); rind of the *matūm* fruit (*Ægle marmelos*); camphor derived from the *nāt* shrub (*Blumea balsamifera*), etc.

The oils most largely employed in perfumery are those of cocoanut, white tilseed (*Sesamum orientale*), and niger seed (*Guizotia Abyssinica*), samples of which are here on view (Nos. 609–11); also, oil pressed from *samrông* berries (*Sterculia fœtida*), etc. These are also used for anointing the hair.

Perfumed Powders and Pastes.—These are compounded with one or more ingredients and scented principles, among which most in use are the bark and root of *kēt* (*Murraya paniculata*), pollen of *sārap'hī* blossoms (*Ochrocarpūs Siamensis*), etc.

A toilet powder, termed *pëng hōm*, is compounded of pulverized burnt chalkstone, scented water, and pollen of *sārap'hī* flowers (see above). It is sometimes made up into pellets with the further addition of musk. Other toilet powders are named *pëng nūen*, *pëng p'hat* (both used for rubbing the face white), *pëng rām*, *pëng sārap'hī* (consisting chiefly of *sārap'hī* pollen), etc.

A perfumed paste called *pëng krachëḥ* is prepared with eaglewood (*Aloexylon agallochum*), camphor, musk, and *kôt hûa būa* (a variety of fragrant *crinum* bulb), rubbed on a whetstone with scented water and then compounded into a paste.

Both are employed instead of ointments or pomades for rubbing on the body and face, and also for perfuming the garments before wearing.

Other cosmetics consist of turmeric (*khamin*) diluted in plain or scented water, with which the body is rubbed after the bath, thereby imparting to it a slightly golden colour; of finely powdered *thōng-lāng* wood (*Erythrina Indica*), and many other substances.

Burning Perfumes.—The most prized are the *calambac*, or *Aquilaria agallocha* wood, eagle-wood (*Aloexylon agallochum*), sandal-wood, and benzoin, which enter in the composition of the scented sticks termed *dhūp*, kindled as an offering in the temples.

Most important among the above-mentioned perfumes, because of its forming the object of a remarkable trade in Siam, is *kamyān*, that is to say, benzoin, or gum benjamin, the famous resin of delicate fragrance obtained from the mountain region in the farthest north of the country (whence it is also termed *kamyān nüa*, i.e. Northern Kamyān), from a shrub analogous, though not identical, to the *Styrax Benzoin* of Sumatra, whence the benzoin of that island is derived. See the special note following next. The method of extracting this gum is to make deep cuttings into the bark, an operation which is performed on trees that have attained a height of eight or ten metres, this being the index of an age from six to seven years.

The wounding of the trees takes place in August, and the resin which exudes from the incisions is left to flow for three months. As the resin comes in contact with the air it hardens, and at the end of this period it is gathered by detaching it with a knife, or by cutting down the tree and stripping it of its bark at the points where the resin has collected. The yield from one tree varies from 400 to 500 grammes in weight.

The benzoin of Siam is far superior to that of other countries, and is in large demand abroad. It differs from that of Sumatra and other parts of the Malay Archipelago also on account of its being put on the market in loose tears or in masses of slightly agglutinated tears instead of in solid lumps.

The local price ranges from six to twelve francs per kilo in the raw state, that is to say, with fragments of bark and other impurities more or less abundantly intermixed with it. Once cleaned, it is widely employed in perfumery to prepare kalodermic lotions and toilet waters, to burn instead of incense; in pharmacopœia for the preparation of balsamic mixtures (among which is the well-known Friar's balsam); and in medicine as an expectorant in chronic bronchitis and other pulmonary affections. Its perfume is exquisite and very delicate, suggesting, among others, that of vanilla.

In trade it is classified, according to the size of the tears, into benzoin of large and small almonds, owing to the similarity in shape and colour of the tears to these well-known fruits.[1] Samples of both kinds figure at this Exhibition under Nos. 611*a* and 611*b*.

This gum-resin drew from the outset the attention of Western navigators and traders. The benzoin from Siam is, in fact, mentioned as early as 1498 in the *Roteiro* or Itinerary of Vasco da Gama's travels; and Giovanni da Empoli (1514) declares it to be the best one,[2] a view confirmed later on by Marini.[3]

G. E. Gerini.

[1] This circumstance explains the terms which puzzled Colonel Yule (see *Hobson-Jobson*, 2nd ed., London, 1903, p. 87), namely: 'belzuinum *mandolalo* from Sian' (in Barret, 1584) and 'benjuy de *amendoada*' or *mandolalo* (= *mandolado*, i.e. in 'almonds') in Garcia de Orta, 1563.

[2] Later references occur in Barthema (1505), Cesare de' Federici (1568, 'belzuin' loaded on ships at Mergui), Ralph Fitch (1587, 'great store of beniamin' at *Iamahey*, that is, C'hīeng Māi), Linschoten (*c.* 1587), Teixeira (1600), etc.

[3] The Jesuit Father Gio. Filippo de' Mariní is the first writer who has given a description of Siamese benzoin (presumably after information supplied by Father Leria). This occurs on pp. 447-8 of his book *Delle Missioni*, etc. (Roma, 1663). The most interesting information we derive from it is that benzoin from Eastern Lāos is the best in the East; that the tree from which it exudes grows on the mountains and has leaves similar to those of the chestnut (i.e. toothed, a most important point this, evidencing that the tree must be, if not exactly the *Styrax Benzoin*, very similar; see in fact the note that follows below). 'The flower,' the description continues, 'is handsome, odorous, and white, almost undistinguishable from our orange blossoms: the berry which it produces is in its turn fragrant, but uninviting to the taste; its shape and size are like that of an acorn.' This is another very important point, suggesting a connexion with *Benzoin subdenticulatum*, which has pyriform fruits.

It may be that the benzoin-yielding trees of North Siam are of several varieties, and not merely of a single one, or else that the resin coming from the Eastern Lāu districts is derived from trees different from those of Western Lāos. The collection of the precious gum is effected by the Meu (*Miao*) people on the mountains and by Phū-thai tribes in the lower region; it is then conveyed by them to the Lāu trading centres and bartered for textile fabrics, articles of clothing, and copper wares.

The best quality of benzoin is of a white soapy colour, almost marble-like in fracture, but yellowish externally, and exhales a most pleasant perfume. Its price rises to as much as even 450 ticals per picul (i.e. about 15 francs per kilo).

Notes on Siam Benzoin

By E. M. Holmes, F.L.S., F.E.S.[1]

In 1859 Sir R. H. Schomburgh, who was then British Consul at Bāngkōk, tried to find out if the tree that yields Siam benzoin is really *Styrax Benzoin*, but the only information he obtained was evidently acquired at second-hand. He stated that the bark is gashed all over, and that the resin which exudes collects and hardens between it and the wood; the resin is then removed, but the authors of *Pharmacographia* remark that it is also evident that all the Siam drug is not thus obtained. No information concerning the tree was forthcoming until in September, 1883, I was able to show at the meeting of the British Pharmaceutical Conference at Southport a leafy twig of the tree yielding Siam benzoin, which I then, and still, believe to be derived from a different species from that which yields Sumatra benzoin. A leaf of the twig was subsequently, at my request, subjected to a microscopical examination, when it was found that it differed in certain particulars from that of *Styrax Benzoin*, which I sent in for comparison. From that time until the present I have been unable to obtain fruiting specimens of the plant from Luang Phrabang, and the actual species from which Siam benzoin is derived and the method of its production and collection have hitherto remained a mystery.

In the number of the *Schweizerische Wochenschrift* for September 3 last, Herr Hartmann Rordorf, apotheker at Basel, has contributed some new and interesting information on the subject, having fortunately been able to obtain leaves, twigs, bark, and resin from the North-Western Province of C'hieng Mai, north of C'hieng-ngai, in the district near the source of the River Mëping. The leaves he describes as 11 to 12 inches long and 4 to 5 inches broad, leathery, longish-ovate, and acuminate. The margin of the leaf is slightly undulate and entire. The upper surface is of a dark olive-green colour and glabrous. The midrib and lateral veins are of a clear brown

[1] Abridged and reproduced, with the author's permission, from the *Pharmaceutical Journal*.

colour and very prominent. The smaller veins are somewhat prominent also. The under surface is of a paler olive-green colour filled with abundant appressed stellate hairs. The whole venation is reddish, and clearly outlined and covered with stellate hairs. There are five to six lateral veins on each side, nearly at right angles to the midrib, at first curved, and then running along the leaf margin, in which they terminate. The leaf stalks are 1 inch long and coloured like the veins, and also covered with stellate hairs. In the axils of the leaves there are small buds and leaflets 1 inch long. Herr Rordorf lays special stress on the fact that two kinds of buds occur in the leaf axils, that the stellate hairs on the leaves are not the same as those of *Styrax Benzoin*, and that the leaves are entire, whilst those of *S. Benzoin* are serrate-toothed.[1]

Herr Rordorf gives some interesting notes concerning the collection of the drug. The difficulty in obtaining information and specimens has been exceedingly great. Since 1907 nine expeditions were sent out to procure material, but until the last one (the tenth returned in June, 1910) all the previous ones had proved failures.

In this neglected district there is a settlement of small, long-haired people who collect the benzoin, and who apparently emigrated from China in very early times. They speak an old, forgotten language, and wear different clothes from the natives of Southern Siam.[2] Their method of collecting the benzoin and preparing it for the market is as follows: On trunks of 20 cm. to 25 cm. in diameter pieces of bark of rectangular shape from a half to four hands-breadth in size are loosened, and the resin runs out on the inner side of the bark, solidifying there by the heat of the sun. This forms the finest quality. The smaller fragments are formed into lumps by hand. The resin is spread out on a strong mat in a heap, and ginger roots, first hollowed and filled with the marrow of the bones of the pig, are mixed with it, and the mats are tied up at the ends into a bundle. The contents are examined from time to time to see if the fat

[1 Cf. the description of the benzoin-yielding tree in Eastern Lāos quoted from Marini above, p. 197, in which the leaves are said to be similar to those of the chestnut, which means that they are toothed. (G. E. G.)

2 These are *Khā* and *Mĕu* (Miao) tribes; see above, note to p. 197. (G. E. G.)]

has been taken up, and if not fresh fat is used. It is said that rancid pork fat will not, like fresh fat, pass through the ginger root. This process takes about one year, its object being to give a fine aroma. When the fat has disappeared from the ginger the drug is ready for export without risk of losing its fine odour through the hot and long journey to Bāngkōk. The natives rub the gum resin with sugar and then make it into an emulsion with water, which is highly prized as a wash and as an addition to baths.

The specimen of Siam benzoin in the Museum of the Pharmaceutical Society, which was obtained from wholesale commerce in this country, in some specimens shows large tears of benzoin on the inner surface of a moderately thick bark. The commercial drug differs from ordinary Sumatra benzoin not only in its vanilla odour, but in the fact that the tears are usually free from one another. It seems quite possible that this is due to their having an oily surface caused by the hog's marrow, which would probably prevent loss of the benzoiasters to some extent, and thus conserve the natural fragrance of the resin. It is interesting to note that resin canals (*Harz-gangen*) have been found by Herr Rordorf to be abundantly present on the inner surface of the bark.

There is one point I do not understand in Herr Rordorf's communication. He states that the leaves of the Siam benzoin plant are entire; and that those of the *Styrax Benzoin*, Dryander, are toothed.[1]

In the Herbarium of the Society there are plants referred to *S. Benzoin*, Dry., from the late Dr. Treub, of Java, and Mr. H. N. Ridley, of Singapore, but both of these have entire leaves with a slightly undulated margin, but are not serrate. Those of *S. subdenticulatum*, Miq., of West Sumatra, which is doubtfully referred to in *Pharmacographia* (second edition), p. 407, as being possibly the source of the Penang or storax-smelling benzoin, have leaves that are slightly serrate. This species differs also in having pyriform fruits,[2] whilst those of the

[1] Cf. n. 2 below.

[2] Cf. the description in Marini quoted above, p. 197, from which it appears that the fruits of the benzoin-producing tree in Eastern Lāos are elongated—if perhaps not exactly pyriform—in shape. (G. E. G.)]

Singapore and Java specimens are spherical, the leaf-stalk of Mr. Jamie's specimens of *S. Benzoin* being twice as long as those of the *S. Benzoin*.

Until, however, fruits are obtained it will not be possible to say whether the Siam plant is a distinct and well-marked species or only a geographical variety of *S. Benzoin*. But in the leaf-stalks and the chemical constituents of the balsamic resin it has decidedly a distinct individuality. Professor Greenish has kindly examined the leaf sections of the two plants in the Herbarium, and finds no difference in the hairs, but the epidermis has larger and longer cells in the Siam leaves, and the cuticle is thicker than in those of the *S. Benzoin* of Sumatra.

CLASS 124

Tobacco: its Cultivation, etc.

In this section only manufactured Siamese tobacco is exhibited.[1] The Exhibition includes samples of cut tobacco, coming from various provinces, and specimens of the numerous kinds of cigars and cigarettes manufactured for local use. The last-named deserve mention for the peculiarity of their wrappers, which, instead of rice-paper, as customary with us, consist of leaves and other vegetal substances. This is undoubtedly due to the fact of the Siamese cigarette being of an earlier origin than the European one. La Loubère, who visited Siam in 1687, says that the people of either sex were wont to smoke, a thing which nowadays seldom occurs, in so far at any rate as women are concerned. In default of thin paper, except that kind of it made and imported from China, which is unfit for cigarette-wrapping, the Siamese had naturally recourse to palm-leaves and other similar materials, which they found most suitable for the purpose. And probably they learned this practice from the natives of India, for the word *burī*, the

[1] For seeds, quality, and cultivation of tobacco in Siam see above, pp. 148 et seqq.

Siamese term for 'cigarette', is of Indū origin, being derived from the Hindustāni *biri*.[1] Be that as it may, the cigarette soon attained a prominent place in Siam among the male population, for whom from tender infancy it constitutes an indispensable diversion and, to some extent, completes the attire. Indeed, one seldom sees a young lad, especially from the country, going out for a walk or proceeding to a festival in gay attire without a reserve cigarette poised on his ear, in addition to the one in his mouth. And on festive occasions he generally prefers, now that paper-wrapped cigarettes are more fashionable than formerly, to adorn his ear with one of these embellished about the middle with a tiny paper fan fully spread out, of a bright red, blue, or green colour, in order that he may look smarter.

The size of Siamese cigarettes varies from that of a pencil to a respectable taper; the larger ones are great favourites with the dandies of the lower classes, who, having lit them, go on puffing forth clouds of smoke out of them enough to put to shame a chimney. At present cigarettes are lit by means of chemical matches, but at the time of the old capital Ayuddhyā matches made with twisted cocoanut fibre were employed for that purpose.

The contents of Siamese cigarettes are not always mere tobacco. In order to increase their perfume there are often added drugs or aromatic herbs, like refined camphor, mint, etc.; while for the more profligate *nāk-leng* or *fétards* there are prepared also *kanc'hā*[2] cigarettes, which bring about sensations of intoxication and revelry similar to those produced by *hashish*.

The leaves mostly employed for wrappers are the following:—

1. *Tōng ōn*, that is, fresh or green banana leaf; the cigarettes so wrapped are of a pale-greenish colour.

2. *Chāk*, that is, leaf of the Nipa palm (*Nipa fruticans*). This imparts to the cigarette a fine glossy appearance and

[1] It seems that tobacco was introduced into India by the Portuguese in or about the year 1605.

[2] Narcotic resin, produced by female hemp, or *Cannabis sativa*, also indigenous to Siam.

a cream-white colour, but also communicates to it a somewhat sharp taste.

3. *Tōng kë*, or old banana leaf; cigarettes wrapped in it are far more agreeable and have a yellowish-white colour.

4. *Makā*, viz. leaf of a medicinal plant.

5. Petals of the royal lotus. The cigarettes so wrapped are the most delicious and best-looking, this enhanced charm being due to the delicate vieux-rose foncé colour of the lotus petals.

Samples of all the varieties of cigarettes above referred to are on view in this Exhibition, as well as specimens of the sweet tobacco employed for chewing along with betel (see p. 149) and of cigars made in European style but with Siamese tobacco.

Besides this a local manufacturer exhibits cigarettes made according to Western methods, with a mixture of foreign and Siamese blends of tobaccos, which have already found favour among foreign residents in the country.

For more details on the method of their manufacture the reader is referred to the note following below, and for three photographic views of the factory, in which female natives are employed, to No. 644 of this Exhibition.

Siamese tobacco is not employed otherwise than has been mentioned above. The pipe, though locally known, is seldom smoked by the natives; and when it is they use foreign tobacco, imported from China, which latter both for taste and smell is execrable on account of the tilseed oil with which it is cured. This tobacco is smoked in special metallic pipes of Chinese shape and make.

G. E. Gerini.

Note on Siamese Cigarette Manufacture

The best Siamese tobacco is produced in the districts of Kāñburī, P'hetchabūn, and Khôrāt. The cultivation is still primitive as well as costly. In fact, it is in the absence of any appreciable import duty unable to compete even for home consumption with the Turkish and Grecian tobaccos.

This not being the season specimens of the best uncut leaves of Siamese tobacco are not obtainable, but various exhibits of

cut tobacco with cigars and cigarettes enwrapped in plaintain or lotus leaves are shown.

The tobacco leaves are received in bulk, carefully examined leaf by leaf, and classified according to strength and flavour. From these the various kinds of cigars and cigarettes are made.

The Siamese tobacco alone is too strong for the average smoker's taste, so it is blended with the imported tobacco. The Siamese cigarette as manufactured by Messrs. Pappayanopulos is a blend of Thessalian, Turkish, and Siamese tobacco in the proportion of 40 20–40 per cent. The selected leaves are passed through first a cutting and next a shaving machine (see the photographs exhibited under No. 644), and then handed on to the fillers and trimmers, who are supplied with ready rolled paper-tubes prepared by other hands. The completed cigarettes are then put in a drying case. The latter consists of a case with numerous meshed trays, a lamp at one end, and a draught drum at the other. The latter is worked by hand, and when the cigarettes are in position the hot air (temperature about 60° to 80° C.) is drawn over them. The cigarettes are next packed ready for sale, and put in a specially contrived store-room which is kept at a constant temperature.

C. Pappayanopulos.

GROUP XVIII

Extractive and Chemical Industries

Serial No.	Exhibitor.	Description of Exhibits.
	Class 106. Products from Mines	
550-6	Royal Agricultural College	Washed tin-ore from P'hūket.
557 60	,, ,,	Unwashed ,, ,,
561–2	,, ,,	Cassiterite, both washed and unwashed, from P'hūket.
563	,, ,,	Wolfram from Samúi Island (Province of Ligore).
564	,, ,,	Auriferous quartz from the Waḍḍhanā Mine.
565	,, ,,	One ingot of tin.
566	,, ,,	Galena from P'hetchaburī.
567	,, ,,	Tin-ore from Tānah Puteh.
568	,, ,,	Copper-ore from the Sōng-P'hrēk Mountain.
569-70	,, ,,	Saltpetre from Saraburī.
571–2	,, ,,	Sapphires, raw, from Bān Yāt (Khlúng District).
573–5	,, ,,	Rubies, raw, from ditto.
576	,, ,,	Spinels from Chanthabūn.
577–85	,, ,,	Photos of mining works and mines.

Serial No.	Exhibitor.	Description of Exhibits.
	Class 110. Ceramic Industries	
586–9	Royal Agricultural College	Rice cooking-pots (*Mō Khāu*) of various sizes.
590–2	„ „	Curry-pots (*Mō Kĕng*) of various sizes.
593–4	„ „	Water-jars (*Óng* and *Hái*).
595	„ „	Portable earthen kitchen.
596–7	„ „	Water goblets of porous clay, ornamented with lotus patterns.
598	„ „	Wash-basin (*Āng*).
599*a–c*	„ „	Stick with design imprinted (*Mai Lāt*) and balls (*Lūk Hin*) for smoothing pottery.
599*d*	Tamagno (Mrs. M.)	Bowl with cover, of old Sawankhalôk crockery.
	Class 115. Distillation of Wood, etc.	
600–1	Royal Agricultural College	Wood oil (*Nam-man Yāng*) from *Dipterocarpus* trees.
	Class 118. Industry of Fats, Soaps, etc.	
602	Royal Agricultural College	Potash for soap-making.
603	Siam Industries Syndicate	Exhibition of soap of various kinds.
	Class 119. Colouring Stuffs	
604*a–c*	Teck, L. C.	One box containing leaves and fruit of *Maklüa* (*Diospyros mollis*) and two bottles of extract of black dye made from same, with sample of silk dyed black by means of this extract.

Serial No.	Exhibitor.	Description of Exhibits.
	Class 122. Skins and Leather; Tanning Extracts; Resins, Varnishes, Rubbers, etc.	
605	Teck, L. C.	Leather tanned with mangrove bark
606	East Asiatic Co., Ltd.	*Getah jelutong* (a kind of gutta-percha yielded by the *Dyera costulata* tree).
607	Royal Agricultural College	Bottle of black lacquer (from *Melanorrhea usitatissima* or black varnish tree).
608	„ „	Piece of wild rubber (*Katang-katiu*) similar to Pará rubber.
	Class 123. Industry of Perfumery, Oils, etc.	
609	Royal Agricultural College	Ground-nut oil.
610	„ „	Sesamum oil.
611*a*	„ „	Cocoanut oil.
611*b–c*	Berli (A.) & Co.	Samples of Siam benzoin (large and small almonds).
	Class 124. Tobacco	
612–13	Royal Agricultural College	Siamese cigars, Havana form.
614–15	„ „	Bāngkōk tobacco (for smoking, and sweet for chewing).
616	„ „	Ayuddhyā tobacco.
617	„ „	P'hetchaburī sweet tobacco (for chewing).
618	„ „	Bisnulôk tobacco (smoking).
619–32	Siam Tobacco Co., Ltd.	Samples of Siamese cigarettes, in various wrappings.
633–41	„ „	Samples of tobacco from various provinces.

Serial No.	Exhibitor.	Description of Exhibit
642	Royal Commission for Foreign Exhibitions.	Samples of tobacco from P'het-chabūn, Padang variety.
643	Pappayanopulos, C.	Samples of cigarettes of foreign type, manufactured in Siam.
644	,, ,,	Three photos illustrating cigarette-making in the Exhibitor's factory.

GROUP XIX

Textile Industries

CLASS 127

Cotton and other Fibres

General Remarks

IN this section of the Exhibition may be seen samples of Siamese cotton, from the ordinary plant as well as from the tree (see note further on for a description of the latter). Specimens of other textile fibres are also exhibited, such as *ramie*, or China grass (*pān* in Siamese), *pō* (see special note further on), and fibre from a species of wild plantain. The two latter are still unknown in Europe, and deserve study. Jute does not yet figure in this Exhibition, because its cultivation has been but recently introduced into Siam.

Next follow specimens of locally woven cotton cloths, especially of the commoner kinds, such as scarves, skirts, handkerchiefs, bathing towels, etc., plain as well as figured. In the line of cotton goods, whether yarns, shirtings, prints, or chintzes, the local industry, which has been languishing for the last fifty years, has been more or less supplanted by the foreign one, aided as this is by labour-saving machinery and scientific research. It is, nevertheless, gradually recovering itself since the introduction of modern apparatus and methods into the country, despite the brisk competition of foreign cotton goods with their alluring cheapness. An idea of this revival of the native industry may be gathered from the

statistics of the Port of Bāngkōk, according to which, in 1909, the total import of cotton went down to 22,876,114 francs, as against the thirty and more millions of the four preceding years. On the other hand, the export of cleaned and uncleaned cotton increased somewhat, amounting in 1909 to 590 tons, worth 214,000 francs. The greater part of the latter is sent to Hong-Kong and the rest to Japan.

Although the spun and woven cotton goods of Siam cannot compete with the foreign in cheapness and attractiveness of finish, they hold their own with regard to quality, and are even superior as far as wear and fastness of dye are concerned. Indeed, they have met with no small appreciation abroad: suffice it to recall that between 1820 and 1830 a cotton material woven in Siam became very fashionable in France under the name of *siamoise*.

The flowered skirts, known as *p'hā pūm*, are very pretty for their variety and harmony of colour. These, however, are only worn by the rich on account of their costliness. But the more substantial materials, glazed and flowered, called *p'hā dib*, are really not far behind them in beauty, and are, moreover, within reach of the more slender purse, as are some other Siamese prints and chintzes known as *p'hā lāi nam chüt*.

The cotton fabrics most largely used in the country are

1. *P'hā lāi*, colour-printed nether garments, worn by the fair sex.

2. *P'hā p'hūn*, coloured woven nether garments, either spotted or checked, worn by men.

3. *Sarongs*, or bag-shaped skirts, made of print and put on the market, not made up.

4. *P'hā hom* or *slendang*, narrow shawls or scarves in very brilliant colours, either worn across the shoulders or draped about the waist by women.

5. *P'hā khāu mā* or *p'hā khāmā*, streaming scarves loosely worn about the shoulders by men, and also used to wrap or tie round the loins when bathing.[1]

[1] In the trade the above woven goods are designated, for simplicity's sake, *pulai*, *pepun*, *sarong*, *pahom* or *slendang*, *pakhama* or *pata*, the latter being nether garments, colour-printed in checks and crosses. (N.B. *Pata* should

6. Turkey-red cloth, used for flags and decorative purposes, turkey red being one of the national colours.

7. White shirting for underwear, hangings, decking, drapery, etc.

8. Grey shirting for garments and various other uses.

9. White and colour-printed handkerchiefs, singlets, etc.

The native implements and methods used for the spinning and weaving of cotton are naturally primitive. For spinning they consist of a saw-gin (similar to our old-fashioned *lupo* or 'wolf'), with cylinders fluted at either end for separating the seeds and impurities from the cotton; of a bow-shaped bale-breaker to soften the fibre; of an iron-pointed spindle on which to wind the lumps of cotton ready to be spun; and of a reel on which to form the skeins.

These instruments are all made of wood, but little by little they are being replaced by modern apparatus imported from abroad.

When the cotton has been spun it is dyed by means of the tinctorial materials and processes already described (see pp. 188 et seqq.). Among the dyes most used are Siamese indigo, *Artocarpus* wood, *Rottlera*, *Morinda*, *Diospyros mollis*, sapan-wood, stick-lac, the heartwood of *Artocarpus integrifolia*, etc., according to the tint required.

The dyed yarn is then soaked in a pap of boiled glutinous rice, which renders it smooth and of stiffer consistency. Then it is combed out by means of a very curious implement consisting either of sharp-pointed sections of fruits from the screw-pine (*Pandanus Leman*) or else of cocoanut shell, arrayed like the teeth of a comb, or, still better, like the bristles of a brush. Cotton is then fit for spinning and reeling.

The Siamese loom is a very primitive contrivance, though not very substantially differing from our hand-looms. Some modern types of the latter have already been imported into

more correctly be spelt *p'hā tā*, 'checked cloth.') The skirt or nether garment (*p'hā p'hūn*, *p'hā lāi*, etc.) is also generically termed *p'hā nūng*: it is evidently derived from the *dhoti* of India, being worn and tucked up in a similar manner. The *sarong* (lit. 'sheath') or bag-shaped nether garment is of Malay (and inland wild tribal) origin. The term *p'hā khāmā* (lit. '*khāmā* cloth') is evidently of Persian origin, namely, from *kamar*-band = 'loin-band', cummerbund.

Siam, but endeavours are now being made to introduce steam looms into the country; only in this way can a thorough revival of the local art of cotton weaving be expected.

G. E. Gerini.

Note on Tree Cotton

(Translated from the original Siamese)

In Siam there are three kinds of trees which produce arboreal cotton, or *nùn*; namely, the *ngiu*, the *ngāu*, and the *nùn* trees. These are particularly numerous in the north, although they also occur in the southern provinces of Siam.

The trunk and branches of the *ngiu* [*Bombax Malabaricum*, or red silk-cotton tree] are thorny and the blossom red; the *ngāu* [*Bombax heptaphyllum*?] has either yellowish or white flowers, and is without thorns. Both these trees grow to gigantic heights, some even attaining fifty metres, and have a girth of $2\frac{1}{2}$ metres or more. They grow in far larger numbers in the jungle than near the villages, for the most part spontaneously, only a few having been planted by man. Their blossom and fruit very much resemble those of the *nùn*, of which a description will be found further on. As soon as the fruit reaches maturity it is gathered. A tree about twenty metres high yields on the average from three to six thousand pods. If by chance these are left too long upon the tree the shell bursts, and the seeds, together with the silk cotton that surrounds them, drop out. The cotton obtained from these two trees is yellowish-white, and almost as fine and glossy as silk.

The *nùn* [*Eriodendron orientale* and *E. anfractuosum*, or white silk-cotton tree, which yields the cotton commonly known as *kapok*] does not appear to be a native of Siam, for it is never found to grow in a wild state: it is even scanty in the neighbourhood of villages, where it has only made its appearance within the last twenty years or so. It is cultivated in Siam chiefly with a view to form hedges, because it grows rapidly and

can be planted in thick rows. Moreover, its branches and foliage are so sparse as to cause no serious encumbrance and to cast but little shade, so that fruit-trees, planted under the *nún*, thrive pretty well. It attains a medium height—about fifteen metres—and bears fruit rapidly. Its blossom resembles those of the *ngiu* and the *ngāu*, except that it is only about half the size; its colour is white or pale yellow. The fruit or pod is from 12 to 15 cm. long and from 2 to 6 cm. in diameter. It does not burst when ripe, as in the two trees already described, but remains intact upon the tree. The silk-cotton within is either yellow or creamy-white.[1]

The above three species of tree yield an enormous number of seeds, and as these contain much fatty matter oil is extracted from them.

The tree cotton of Siam has not yet formed an article of export, because, up to the present, only that amount has been gathered which lies within easy reach in the inhabited tracts of the country. It is only used for stuffing mattresses and cushions, being fairly soft and light. Its fibre, however, has but little tensile strength in comparison with that of the grass cotton, and is therefore unfit for textile purposes.

THE ROYAL AGRICULTURAL COLLEGE.

Note on the Pān or Ramie of Siam

(Translated from the original Siamese)

The *ramie*, termed *pān* in Siam [China grass or *Rhea*], has long been cultivated in the country. To-day it is planted almost everywhere, but more especially in the provinces of Rājburī, Nakhōn Sawann, and C'hump'hōn.

[1 The capsule, with its contents, makes a capital pocket fire-carrier. It is about the size of a duck's egg, and by merely removing a piece of the shell at the top, in the shape of a cap, and lighting the cotton within, it will smoulder for hours. The cap should, of course, be replaced, and the capsule can then be safely carried in the pocket, with a fire ready to hand for any emergency. (G. E. G.)]

It grows to a height of $1\frac{1}{2}$ $2\frac{1}{2}$ metres, and the stem has a diameter of $1\frac{1}{2}$–2 centimetres. It is covered with fine down, and the leaves are very like those of the stinging-nettle, only a great deal larger (from 10 to 15 cm. long by 11 to 13 cm. wide). They are saw-edged, but do not sting. The upper side of the leaf is pale green, whilst underneath it is green, mixed with white,[1] and covered alike on both sides with down.

There are two varieties of this plant in Siam, one red (*pān sài dĕng*), the stem and flowers of which are bright red, the fibre being red too; and the other white (*pān sài khāu*) with pale-red stem and blossoms, but with white fibre. They are both grown from seeds or cuttings, once in seven or eight years, as they are capable of sprouting up again after being cut down. After the fourth or fifth year, it is, however, better not to let them reproduce in such a manner, as the result would be a weaker plant and an inferior kind of fibre.

They should be cut down before blossoming, and when the stem begins to turn yellow. The stalk is divested of twigs and leaves, and split all the way down with a knife. The bark is then peeled off in strips. The green peel outside the bark is scraped away with a blunt knife or a bamboo lath, leaving only the fibrous part, which is put in the sun to dry. It is then tied up in bundles and stored away or else sent to the market.[2]

THE ROYAL AGRICULTURAL COLLEGE.

Note on Pō, or Siamese Hemp

(Translated from the original Siamese)

There exist many varieties of *pō*, or Siamese hemp plant [*Paritium macrophyllum*, see the remarks already made on p. 148 , among which are the following :

[1] This variety of *ramie* seems therefore to be the one termed simply *Bechmeria nivea* (China grass or *Rhea*), the leaves of which are covered underneath with white down, whilst the leaves of the other, *Bechmeria nivea*, var. *tenacissima*, are much larger, and green on both sides. (G. E. G.)

[2] Since 1910 experiments have been made with flaying machines. (G. E. G.)]

1. *Krachâu.*
2. *Fāi*, or cotton-like.
3. *Dĕng*, or red.
4. *Khāu*, or white.
5. *Mān*, or glossy.
6. *P'hrān*, or hunter's.
7. *Kĕu*, or gem.

They all yield fibre and grow wild. The first of them, *pō krachâu*, is, however, cultivated as well on a large scale. It must therefore be referred to at some length.

The plant is largely sown in the provinces of Ayuddhyā, Rājburī, Prāchīn, etc. Its stem is straight and smooth, about 3 metres high and $1\frac{1}{2}$ centimetres in diameter; the leaves are lobate, long, pointed, and not felted, measuring from 10 to 15 centimetres in length and from 4 to 5 in width. The inflorescence forms yellow clusters which become transformed later into bunches of round segmented berries. Each berry has from four to five segments, each of which contains from nine to ten seeds. Each bunch consists of from three to four berries.

This plant prefers a damp and rather sandy soil, although it also grows in dry places. But, similar to paddy, irrigated ground suits it best of all. After the ground has been ploughed and weeded, it is sown and lightly watered. When it is sufficiently grown it is watered abundantly, the ground being kept as much as possible under water, a course which suits the plant even better, as it is wont to stand even long periods of inundation.

The harvest takes place when the plant has attained a height of $2\frac{1}{2}$ metres or so, and, in any case, before it has flowered. It is then cut, the leaves are stripped off, the stem is split, and the bark removed. The outside peel is scraped away from the bark, leaving only the inner fibrous substance, which is put in the sun to dry. It is then tied into bundles, ready for use or sale.

The fibre of this particular *pō* is, however, not very strong or capable of much wear. It is used chiefly in ordinary work, such as to make ropes, oar loops or rings, etc.

The other varieties of *pō*, as has been said, grow wild. The fibre they yield is a good deal stronger, and they are cut down in the woods as required. For instance, when cordage is required for any purpose, one has recourse to the jungle, and there he cuts as many of such plants as he wants, stripping them of their bark as described above.

There is no doubt, however, that in order to obtain a softer and whiter fibre, and one capable of a good deal more wear and tear, it would be more profitable to thoroughly soak the stems first and then submit them to a breaking and scutching process, as is done with ordinary hemp. The latter remark applies to the cultivated variety in Siam as well as to the wild.

THE ROYAL AGRICULTURAL COLLEGE.

[*Note.*—The fibre obtained from the plant by the above primitive process is, as can be imagined, very coarse and of a reddish colour, and therefore unfit for fine work, as it would be had it been soaked and then broken.—G. E. G.]

CLASS 130

Silk Weaving

The features of this class are the implements used from time immemorial in Siam for the reeling, twisting, and weaving of silk. They are of course very primitive, with the exception of the rosewood loom (No. 691), which differs but little from the old-fashioned hand-looms that were employed till a century or so ago by us. It need hardly be said that this apparatus is gradually falling into disuse. These implements are being replaced by the modern improved ones from Japan or Europe, some of which may be seen represented in the photos exhibited.

After this premiss it will be well to give some slight information about the methods of working silk in Siam, so that the purposes of the various implements exhibited may be better understood.

Spinning and Reeling.—The cocoons, after having gone

through a process of selection for quality and colour, are put into a cauldron of nearly boiling water for some few minutes in order to kill the chrysalides and soften the silk. A little cold water is then poured into the cauldron in order to bring down the temperature to about 80° C., and the cocoons are lightly rubbed for a moment with a brush, made from the tops of rice straw, in order to remove the floss all round, which is put aside as waste. Fresh water is then added to the cauldron, reducing the temperature to about 65° C., and the silk is then wound off the cocoons by means of spinning-wheels worked by hand.

The next operation consists in winding off the strand of silk upon a reel and transforming it into hanks, each weighing about 35 grammes. It is in this form that raw silk is put upon the market.

Matching.—The hanks of raw silk are then soaked for about a quarter of an hour in a hot solution of soap in order to make the thread lissome and of even consistency. The strands are then arranged on different wheels and spindles, whence they are matched and wound off upon bobbins.

Throwing the Silk.—The bobbins are then mounted on the creel of the twisting frame, which, by gyrating, twists the various threads together, forming them into a single strand, which is wound off upon pieces of bamboo. From these it is rewound into skeins (or hanks). The twisting imparted to the threads of Siamese silk is usually done right-hand wise, whether it is for the woof or the warp; unless they are to be used for the weaving of the long-trained, shot-silk skirts, called *hāng karōk*, in which case the thread for the woof is composed of two differently coloured threads, which had before being dyed been twisted, each separately, left-hand wise and then, after dyeing, been twisted together from the right hand. Of course, the amount of twisting, or throwing, required for these various operations is gauged by mere guess, and is accordingly far from uniform.

The Ungumming and Bleaching of the Twisted Silk.—The ungumming, or *décreusage*, and bleaching is done by soaking the silk twists for about twelve hours in a cold alkaline lye of

potash. About three parts of the liquid is then thrown away, and what is left is diluted with pure water, put upon the fire, and allowed to boil until the silk is white. The hanks are then taken out, rinsed in running water, and spread out in a shady place to dry. Thus it will be seen that the bleaching of Siamese silk is brought about in great measure by boiling.

Dyeing the Twisted Silk.—This is carried out by means of the colouring matters and processes already described (see pp. 187–91). For some fabrics of variegated colour, such as, for instance, the famous Lāu and Siamese flowered skirts, worn by the rich, called *p'hā pūm*, the silk, before being soaked in the dye, has those parts of it which are meant to be left white wrapped round with the leaves of the *kap'hō*, a shrub whose foliage, like that of the Palmyra palm, is also used as a covering for the native resinous torches. After the first dyeing has been accomplished the leaves are removed, and others of the same kind are wrapped round the places already dyed, as well as round the parts which are to remain as they are. The silk is then soaked in a second bath of a differently coloured dye. This operation is repeated until the silk has taken on the variegated tint required. When it is woven, a material flowered alike on both sides is the result. It is greatly prized in the country. It has, indeed, been used from time immemorial for the nether garments of the dignitaries of state in Siam. It is believed that the processes of dyeing and weaving which produce it originated in Siam.

Starching.—This is not done with a starch size, but by means of an analogous mixture, obtained by boiling glutinous rice down to a pap and then filtering the decoction. The hanks of twisted and dyed silk are plunged into this and well soaked, after which they are taken out and placed to dry in the shade.

Winding the Silk.—When the dried silk has been placed upon the spindle, the thread which is to form the woof is wound upon the spools. However, for the *hāng karōk* fabrics, that is to say, shot silks, two threads of different colours are put together and twisted into a single thread (or organzine), as has been already described.

The threads which are to form the warp are arranged, four at a time, by hand into a chain, which process, of course, is a fairly lengthy one. The warp, when it has been wound round a wooden frame (which in Siam takes the place of our weaver's beam or tambour), is put in the loom.

Method of Handling.—The Siamese loom has but two healds. Into the mails, or metal eyes, of these are threaded the threads of the chain in the following order: The first thread is put into the first mail of the first heald, the second thread into the first mail of the second heald, the third thread into the second mail of the first heald, the fourth thread into the second mail of the second heald, and so on for each successive round.

Passing through the Comb.—The passing of the warp through the comb is done by passing two threads at a time between each tooth or interstice; thus the first pair of threads is introduced into the first interstice, the second into the second, and so on. The ends of the threads are then secured to the weaver's beam, facing the weaver.

Weaving.—From each heald hangs a stick, which corresponds to our pedals or treadles. The weaver (in Siam only women weave) presses the right-hand stick with her foot, meanwhile pushing the shuttle from right to left. She then presses the left stick, and pushes the shuttle from left to right. After each plying of the shuttle to and fro she pulls the comb towards herself, thus pressing her woof and warp together.

Quality of Siamese-woven Silk.—Up to the present time only native silk has been spun in Siam, in the primitive style and with the rudimentary tools described above. For some years, however, the Royal School of Sericulture has been introducing modern looms and more perfected methods, the use of which is daily increasing.

Each Siamese district where silk weaving is carried on has its characteristic silk fabrics, which are distinct from one another at a glance either in style or arrangement of colour. They are all, however, of like structure, based upon the taffetas weaving pattern,[1] and are thus identical in appearance on both

[1] What is meant is that the ratio of the threads of the woof and of the warp is the same as occurs in taffetas fabrics.

sides. The shape and size of the pieces depend upon the uses to which the fabric is to be put, and do not vary much in these respects from the pieces of cotton stuffs already described. Such pieces would, however, generally include skirts, scarves, shawls, and *sarongs* or kilts, and, amongst these last, the famous striped ones, as well as the plain-coloured and shot ones, of Khôrāt, the check and plaid silks of Patāni, and the flowered and brocaded ones of other provinces, of which there are various examples in this Exhibition.

It will be observed that metallic threads of gold or silver are used to mark the ends as well as the selvedges of most of the pieces of plain-coloured or shot silks, in which the warp is of a different colour from the woof, as, indeed, it usually is in Siamese fabrics. But gold and silver brocades, satins, velvets, and the like are nowadays rarely produced in Siam, and are as a rule imported from abroad.[1]

G. E. Gerini.

[1] However, the missionary Gervaise, who was in Siam from 1681 till 1685, says in his book (*Hist. du Roy. de Siam*, Paris, 1688, p. 137) that the Siamese in his time had 'appris des Chinois à faire des étoffes de soie d'or et d'argent'. Moreover, at the Paris Exhibition of 1867 there appeared Siamese fabrics woven with either gold or silver thread, which were much admired. Among the presents sent to France by the King of Siam in 1685 with the De Chaumont embassy, there is mention of '1 manteau de dame de Siam *doré, de soie de Patani*, qui servira de montre' (Chaumont, op. cit., p. 244). The silken skirts, undercoats, and other garments used at present at Court are generally embroidered with gold or with gold and silk, those of white silk having gold borders.

GROUP XIX

Textile Industries

Serial No.	Exhibitor.	Description of Exhibits.
	Class 127. Cotton	
645–53	Royal Agricultural College	Sample cottons.
654–5	.. ..	Sample tree cotton.
656	.. ..	Tree cotton in pod.
657–64	Chanthabūrṇ, Province of	Cotton clothes (7).
665–6	.. ..	Wrappers (2).
667–71	.. ..	Handkerchiefs (5).
	Class 129. Textile Fibres	
672–81	Royal Agricultural College	Samples of textile fibres, including varieties of *Pō* (*Paritium* var.) and *Pān* (Ramie).
682	P'hūket, Province of	Samples of fibres from *Musa silvestre* (Trang District).
	Class 130. Silk Weaving	
685–90	Royal Agricultural College	Photos of Government Silk Farm at Khôrāt and School of Sericulture at Bāngkōk (set of 12).
691	Nagara Rājasīmā (Khôrāt), Province of	Silk hand-loom (in rosewood) and apparatus for silk-spinning and reeling.

Serial No.	Exhibitor.	Description of Exhibits.
	Class 131. Silk Yarns and Fabrics	
692	Royal Agricultural College	Panel of silk twist.
693	.. ..	Panel of silk cloths.
694	.. ..	Twist of raw silk.
695	.. ..	Twist of spun silk.
696 701	Nagara Rājasīmā, Province of	Best silk cloths (6).
702 3	.. ..	Second quality silk cloths (2).
704 5	.. ..	Third .. (2).
706 10	.. ..	Fourth .. (5).
711 13	.. ..	Fifth .. (3).
714 17	Chanthabūrṇ, Province of	Silk cloths (4).
718 20	.. ..	.. (3).
721	.. ..	.. (1).
722	.. ..	.. (1).
723	.. ..	Cotton and silk cloths (1).
724-6	.. ..	Silk wrappers (3).
727-39	Patāni. ..	Silk sarongs (13).
740-4	.. ..	Silk wrappers (5).
745-7	C'hump'hōn ..	Silk cloths (3).
748-53	.. ..	Silk wrappers (6).
754-9	Nagara Śrī Dharmarāj, Province of	.. (6).

GROUP XX

Wearing-apparel Industry

CLASS 133

Dress and Vestments, Embroidery, Fans, etc.

General Notes

OWING to the tropical climate and the custom obtaining among both sexes in Siam of wearing garments not requiring any sewing, as they merely consist of pieces of cloth wrapped and tied round the waist and the lower part of the body, the sartorial art had no chance until recently of attaining any particular development in the country. Accordingly it limited itself in the past to the preparation either of plain underwear and jackets for daily use, or of State dresses for the Court and its dignitaries, as well as of stage costumes for theatrical actors. It was in such state and gala dresses, usually made of brocade and other precious stuffs, that the talents of local embroiderers, rather than tailoring skill, ever found scope.

The elaborate dresses and vestments referred to consisted, as they do even nowadays for ceremonial occasions, of tight-fitting jackets or short tunics of brocade, of silk gauze or tulle mantles profusely embroidered with gold, with the addition for royal personages and theatrical actors [1] of epaulettes or shoulder winglets with curved-up tips, of hand-painted silk scarves, belts, collars, breeches, and under-trousers, all gorgeously embroidered and studded with golden or silver spangles and little stars, with

[1] For stage costumes see p. 86 above.

pearls or beads, and often with gems. Formerly, wings of the golden beetle and other fancy articles were also used in trimming, but lace—except of gold—only to a rare extent, because of its obvious unsuitableness in hot climates.

For the above reasons the art of embroidery—and to a certain extent also that of hand-painting in gold and silver—had strong inducement to develop, soon attaining a high degree of excellence. Besides garments in the strict sense of the word, this art was applied also to accessories of dress and upholstery, such as, for instance, headgear, slippers, pillows and cushions, shawls, coverlets and curtains, fans, umbrellas, saddlery, elephant and horse trappings, etc.

The climate being unsuitable for the use of furs, the employment of ornamental products of the local fauna was restricted, beyond the wings of golden beetles referred to above, to feathers, of which the country yields splendid varieties. These range from the stately plumes of the peacock to the most varied, bright-coloured of the rarest birds. They were, however, not turned into account for millinery purposes and for personal adornment, but solely for the manufacture of articles of every-day use, and among these chiefly for fans.

Here is a class of accessories to the wearing apparel which, in the East, whence it originated, often has, moreover, as also in Siam, a symbolic meaning, for it constitutes an emblem of dignity and denotes in such a case the rank of the possessor. Such are, for instance, the long-handled, large flabella, gorgeously gilt and embroidered, which are carried by the side of the royal elephant or palanquin on State occasions, whether to serve the purpose of sunshades or of fly-whisks[1]; and such are also the

[1] Such flabella are severally termed

(1) *P'hat bôk*, or 'ventilating fan', of gold-embroidered velvet and heart-shaped, fixed on at almost a right angle to the top of a gilt pole over two metres long. The fan is waved to and fro horizontally whilst the staff is held vertically by the bearer.

(2) *Bang-sărya*, or *tân tawan* ('sunshade'), also heart-shaped, though more elongated than No. 1, and similarly embroidered, but far larger, fixed upright on to the top of a gilt handle some two metres long. This is held up vertically on the sun side of the royal elephant or palanquin.

(3) *Chamon*, or fan with radiating ribs, similar to the talipot palm fan.

(4) *Bang-sĕk*, or ovate fan, with a lance-shaped tip.

Most of these are royal insignia, and all symbols of dignity.

embroidered silk or velvet fans (according to rank) termed *p'hat c'hanī*, carried in the hand by the chief Buddhist monks on festive or ceremonial occasions.

The monks who have not yet received a degree in the ecclesiastical hierarchy simply carry a *tāla-pat* or fan made of the leaf of the talipot palm (*Corypha umbraculifera*), termed *lān* by the Siamese. It is from such a large and highly useful leaf—which has been aptly described as 'a tent to the soldier, a parasol to the traveller, and a book to the scholar'[1]—and partly also from the smaller leaf of the palmyra or fan-palm (*Borassus flabelliformis*), better known in Europe because of its often adorning our gardens, that the common fan, as well as the liturgical flabellum, originated in the East, whence they were later adopted with some modification in the Occident.

Out of the palm-leaves just referred to fans for domestic use are made also in Siam, which are durable while costing a mere trifle. All that is needed is, in fact, to clip one of such leaves round in a regular form, to fold it fan-wise at narrow intervals, and to tie the folds at the bottom of the leaf-stalk, while allowing them to slightly spread out in radiating directions above; and a complete fan is thereby produced. The stalk or handle of the fan is left either as it stands or elaborated, giving thus origin to two distinct classes, or rather varieties, of such fans, viz. round- and flat-handled. These are respectively termed *p'hat khan klom* and *p'hat khan bën*.

Obviously the fans obtained by this process are rigid, and do not admit of being closed and opened out, like our fans with movable ribs. The latter were perhaps invented in China, whence fans of such style have been to this day imported into Siam. They are made of paper glued on to wooden ribs, and are termed *p'hat dam chin*. Those of painted silk, mounted on lacquered wooden frames with a handle of the same make, coming from Japan, are nevertheless still of the rigid type derived from the palm-leaf.

Besides the palm-leaf fans described above, intended to be waved about by the bearer himself for his own personal comfort,

[1] Sydney Smith. Of such leaves, *olas*, or slips to write on, are in fact made. For these see the notes prefixed to Group XXIII.

other styles of fans are manufactured in Siam in large numbers, provided with handles even over a metre in length, the task of waving them being left to menials. Thanks to such devices well-off people may, in that tropical climate, attend to their occupations without the additional worry of having to fan themselves.

In recent times, however, the long-handled fans just described have been to a large extent ousted by the Indo-European *punkah*, or long rectangular frame decked with cloth or linen which is hung to the ceiling of rooms by means of ropes like a pendulum, and which is made to swing by the pulling of a string. The *punkah* is nevertheless now being in its turn gradually relegated among the cimelia of the good old time owing to the encroachment of the electric fan.

The long-handled fans referred to, as well as a large proportion of the short-handled ones, are made of bird feathers of numberless varieties. First, from the point of view of practical efficiency, stand the snow-white wing feathers of the pelican, a bird occurring in plenty on the rivers of Siam. Such feathers suit the purpose admirably well, thanks to their considerable length and resistance. Next in order of importance come the feathers of other birds and palmipeds, even domestic, while for more elaborate fans feathers of rare birds of the most gaudy colours and metallic iridescence are employed, except those from the ostrich, because of its not being indigenous to the country. The fan is completed by the addition of embroideries and other ornaments, according to quality and price. The form of such fans imitates as a rule that of the leaves of the sacred *bô* or *bodhi* tree (*Ficus religiosa*), which greatly resemble those of our poplar. It is, on the whole, the shape of a heart turned upside down, that is to say, with the tip turned upwards and more or less acuminate.

Feather fans, both short- and long-handled, and answering to the above descriptions, will be found in the present Exhibition.

G. E. Gerini.

GROUP XX

Wearing-apparel Industry

CLASS 133

Fans

Serial No.	Exhibitor.	Description of Exhibits.
760–1	Province of Ayuddhyā	Large fans (2) of pelican feathers.
762–3	,, ,,	Fans (2), medium size.
764–5	,, ,,	,, (2), medium size.
766–7	,, ,,	,, (2), medium size, of white feathers.
768–9	,, ,,	Fans (2), small size, of kingfisher feathers.
770–1	,, ,,	Fans (2), miniature size, of kingfisher feathers.
772–3	,, ,,	Fans (2), medium size, of black feathers.
774–5	,, ,,	Fans (2), medium size.
776–7	,, ,,	Fans (2), small size.

Nāga ornament over a gong (Exhibit No. 328 of the present Show)

GROUP XXI

Precious Stones and Metals, Knick-knackery, etc.

CLASS 135

Jewellery, Gold and Silver Ware

Historical Jottings

THE crafts of the goldsmith and silversmith have brilliant traditions in Siam, especially in her southern provinces. Here became famous, from the remotest period, the Ligor niello wares, products of an art now well-nigh extinct,[1] which, like the other one, less widespread and not so old, of gold and silver damascened and encrusted bronzes after the style of Beder or Bidri, was undoubtedly introduced from India. This may be argued, moreover, from the fact that in Siamese gold and silver wares the *champlevé* enamel, which is characteristic of India, predominates, whereas the *cloisonné* style, peculiar to China, did not become known in the country

[1] The Siamese Government is just endeavouring to promote its revival. The Ligor or Lakhōn niello wares differ from those of other parts of Siam on account of the colour of the enamel, which is black, and also of their exquisite workmanship, which surpasses any other local product of the kind. The vessels are usually made of silver; the ground is chased or hammered down, so as to have the pattern, which is as a rule a floral design, to stand out in relief. This is sometimes left in this state, but in most instances it is gilt. The depressions constituting the background are then filled with a black metallic alloy or niello, which is fused therein through the agency of fire, so as to completely fill the hollows up to the level of the pattern in relief. In this manner a smooth surface is obtained of golden designs, showing to advantage on the black (dull and not bright) ground of enamel.

till towards 1200 A.D.,[1] and has been to this day but seldom employed.

On the other hand, in the extreme north of Siam, that is, in the Western Lāu or C'hīeng Māi principality, the gold- and silversmith art did not begin to make any progress worth mentioning till after 1290, when King Mang-rāi of that State, having made an expedition to Pagān (the capital of Burma at that period), brought thence five hundred families of gold- and silversmiths and bronze-workers to settle in his own dominions.[2] Much benefit accrued from this step, and the industry soon attained a high degree of perfection. This is still maintained to the present day, especially in the chased and filigree silver wares peculiar to that land, which has now become the northernmost province of Siam.

The gold- and silversmith crafts in the southern provinces continued to flourish just as freely, doing full honour to its oldest traditions, so much so that towards the end of the seventeenth century the missionary Abbé Gervaise, who had resided for four years (1681–5) in the capital Ayuddhyā, refers to such art in words of the highest praise, placing it on about the same level of excellence as that of Europe.[3] He extols, furthermore, the local damascened and filigree work, of which splendid specimens still remain to this day (daggers, knives, and shears, whether damascened or encrusted with gold); while, on the

[1] See my paper on this subject in the *Asiatic Quarterly Review* for October, 1902, p. 397.

[2] The gold- and silversmiths at C'hīeng Tung, the bronze, copper, and iron workers at Kum-kām, and the gong-makers at C'hīeng Sēn. Thus the C'hīeng Māi chronicle, from which I cull these particulars. Pagān had already been taken and destroyed by the Mongol army in 1284. According to the chronicle just referred to, it was the Burmese king (Kyoaswā) who granted the five hundred families of artisans to Mang-rāi.

[3] He says in fact: 'Les orfèvres de Siam ne sont guère moins habiles que les nôtres, ils font mille petits bijoux d'or et d'argent, qui sont les plus galants du monde; il n'y en a point qui damasquinent plus proprement, ni qui réussissent mieux dans les ouvrages de filigrane, ils se servent très-peu de soudure, parce qu'ils ont une adresse pour lier ensemble, et enchasser si bien les pièces les unes dans les autres, qu'il est même assez difficile d'en remarquer les jointures' (*Histoire naturelle et politique du Royaume de Siam*, Paris, 1688, p. 135). Turpin, a century later, expresses no less flattering an opinion: 'L'orfèvrerie y produit des chefs-d'œuvres, & l'on en tire des ouvrages de filigranes & des pièces damasquinées, qui font honneur à l'industrie de l'artiste' (*Histoire civile et naturelle du Royaume de Siam*, Paris, 1771, t. i, p. 142).

other hand, but few are now manufactured owing to the decline of these branches of the goldsmith's art.[1] The Siamese gold-beater, however, who with his primitive wooden mallet turns out excellent work, has ever been the subject of admiration from foreigners.[2]

As regards artistic bronze wares, Siam has ever held in the past a pre-eminent place among the surrounding nations: for her statues cast by the process *à cire perdue*, which, once in great favour among the ancient Phœnicians, is said to have been rediscovered by the Italian prince of goldsmiths, Benvenuto Cellini; for her vessels of the prized black bronze termed *samrit*, the recipe of which alloy ever remained a secret to foreigners till it was disclosed by the writer of these lines[3]; for her bells; and for her gongs, in which the province of C'hĭeng Māi excelled above all others.[4]

Achievements of Southern Siam appear, however, to have been the three large auspicious gongs, 3 cubits (*c.* 1½ metres) in diameter, which, according to tradition, were hung at the gates of the Prathom Chedī Pagoda about 910 A.D., and which a century later aroused the covetousness of a king of Pegu. At present the former excellence is still upheld in chased work, so that Siam as regards her repoussé gold and silver wares ranks on a par with any other nation.

The same may be said of her knit-work in wires of precious metals, like gold chains, belts, and so on; while remarkable progress has also taken place in the methods of setting gems,[5] and improvements have been introduced in enamels.

[1] In the list of presents sent by the King of Siam to France in 1685 figure among others: '2 pièces de canon de 6 pieds de long, de *fer battu à froid*, *garnis d'argent*, montés sur leurs affuts aussi *garnis d'argent*, faits à Siam' (see Chaumont, op. cit., p. 232).

[2] Turpin wrote, in fact, in 1770: 'C'est surtout à battre l'or, et à le reduire en feuilles très-minces, que les Siamois font éclater leur industrie' (op. cit., p. 143). And La Loubère observed in 1687: 'They are excellent Gilders, and know very well how to beat the Gold' (op. cit., p. 70).

[3] See *Asiatic Quarterly Review*, loc. cit.

[4] See note 2 on the preceding page. King Nārāi of Ayuddhyā, in the course of his expedition against C'hĭeng Māi in 1667, undertaken in order to bring that rebel State back to allegiance, made it a point, among other things, to obtain a famous gigantic gong kept in that city, the ring of which could be heard at several miles distance.

[5] Up to recent times such methods have been rather primitive, restricting themselves to the setting of gems *à nuit*, i.e. enchasing them into the gold

A vast field still remains open to the art of the burin, as yet too little practised in the country. In its infancy is also the lapidary craft, which, indeed, never attained there any noteworthy development, most of the gems dug out of the local mines being sent raw abroad, or else entrusted for cutting to artisans of other nationalities.

The same remark applies to the other branch of lithoglyptics relating to the art of engraving hard stones with a view to converting them into seals, etc. Numerous enough, indeed, in Siam are statuettes carved out of jade, quartz, and other hard stones, the most famous among them being the highly prized image in nephrite or green jade vulgarly known as the 'Emerald Buddha', kept as a palladium in the royal temple of the capital. But all or nearly all are of foreign origin, as also are the agate, onyx, jade, and lapiz-lazuli slabs which wealthy Siamese delight to have enchased in the lids of their cigarette and betel boxes.

The ever-increasing invasion of Chinese goldsmiths, who, unable to acquire a full grasp of the native style of ornament owing to this largely differing in character from their own, attempt to imitate it in their productions intended for local consumption, has the effect of flooding the market with pseudo-Siamese gold and silver wares of a hybrid and tawdry make. It would be well as time goes on to be increasingly observant of the baneful influence of this production upon the genuine and eminently characteristic native one, in order to prevent any possible degeneration of the latter.

Descriptive Notes

The gold and silver wares of genuine Siamese make consist at the present almost entirely of personal ornaments, accessories of wearing apparel, domestic vessels, and various pieces of art, whether lay or sacred. The gold and silver employed to make

work. In 1687 La Loubère had already noticed the deficiency of Siamese jewellers in this line: 'they neither know how to polish nor to set precious stones' (op. cit., p. 70). Nowadays, however, gem mounting *à jour* is already widely practised in the country.

them are brought to a state of almost perfect purity, no less than 23 carats, with evident detriment to their durability, owing to the excessive softness of the metal. But against our alloys of a lower standard of fineness there stands the native tenet, not to call it superstition, which ascribes to pure metals, and above all to gold, auspicious and beneficent properties for the wearer or the employer. The less wealthy classes resort, however, for objects of everyday and more common use, such as, for instance, plate, to a less expensive alloy called *nāk*, which consists merely of one part of fine gold and three of copper. Although incorrectly recorded by the name of 'tombac'[1] by the early European writers on Siam, the alloy in question is actually red gold, or 6 carats gold. It looks well, takes a fine gloss upon burnishing, and serves admirably to make plate, thanks to its toughness and capacity of standing wear and tear.

Personal Ornaments.—These consist of—

1. Single or double gold chains, remarkably long, to carry across the shoulders, for ladies; and watch-chains, much shorter, for gentlemen.

2. Gold necklaces, jewelled or not, for ladies and children.

3. Jewelled gold pendants, hanging from a necklace on the breast.

4. Flat belts or girdles of knit gold or silver wire, with clasp jewelled or not, for children and adults.

5. Diamond or jewelled ear-rings for ladies.

6. Jewelled gold rings, signet rings with hard stones enchased; auspicious rings: (*a*) studded with nine different

[1] From Sanskrit *tāmra* and Pāli *tamba*, through the Malay *tambaga*, all meaning copper. Ovington wrote in 1690 that ''Tis thought to be a kind of natural compound of Gold, Silver, and Brass, and in some places the mixture is very Rich . . . in others more allayed, as at Siam'.

Chaumont in 1685 speaks of Siamese tombac as 'plus estimé que l'or' (op. cit., p. 232), but his companion, the Abbé de Choisi, frankly declares, 'Pour moi, je ne trouve point cela si beau qu'ils disent,' and thus describes the alloy: 'le *Tambaque* est une matière composée de sept parts d'or sur trois parts d'une espece de cuivre qu'on trouve dans les montagnes de Siam, et ce cuivre est huit fois plus fin que le cuivre ordinaire, est fort rare, et donne à l'or un éclat brillant qu'il n'a point tout seul. Vous en verrez un grand vase parmi les présents du Roi' (*Journal du Voyage de Siam*, Trevoux, 1741, pp. 353-4). Elsewhere he expresses the opinion that 'c'est peut-être *l'Electrum* de Salomon' (op. cit., p. 281).

gems (symbolizing the nine planets superintending the human destinies); (*b*) of gold wire interlaced in the form of a double figure-of-eight knot; (*c*) in the form of a coiled serpent, etc., for the young and adult.

7. Gold and silver bracelets and anklets, open and terminating in a knob at both ends, for children.

8. Large hairpins, whether plain or with an elaborate and jewelled head, used to insert into the top-knot worn by children on the crown of the head.

9. *Chab-ping* (or *krachab-ping*), golden fig-leaves, or pubic plates, for female children.

10. Golden peppercorns (*p'hrik-thʉ̄t*) and olivets (*khûn-p'het*), hanging from a string tied round the waist of children.

11. Gold or jewelled buttons for jackets of both sexes, etc.

Other rarer ornaments might be added, such as the royal crown, princely coronets, and diadems and frontlets, gold-leaf masks wherewith to cover the face of the dead, amulets of various sorts, etc.

Accessories of the Wearing Apparel.—The following may be enumerated:—

1. Knives, daggers, and swords, with silver scabbard and hilt, jewelled or not, and with blade damascened or not, worn in the girdle or carried in the hand.

2. Chased gold and silver pommels for maces and walking-sticks and umbrella handles.

3. Cigarette and betel leaf cases, either cornet-shaped, but flattened in the native style, or rectangular, with spring lid after the European pattern, made of chased gold or silver and studded or not with precious stones.

4. Betel requisite boxes, with the necessary outfit for betel-chewing, made of chased gold or silver, and jewelled or not, etc.

Plate and Vessels.—1. Boxes and receptacles of various forms and sizes, of chased gold or silver, enamelled and jewelled or not, for soft wax (to rub the lips), sweet tobacco (to rub the teeth), refined camphor (for chewing), and other things.

2. Little gold or silver vases and phials with foot and conical lid, enamelled and jewelled or not, for cosmetics, pomades, etc.

3. Bowls of gold or silver, chased, niellated or not, of various sizes, for water.

4. Gold or silver wash-basins, among which the peculiar one termed *khân sākhōn*, the *sāgara* or 'ocean' basin employed for princes, and the flat golden one, gong-like in shape, termed therefore *khōng c'hai*, 'gong of victory,' used to wash the feet in auspicious rites.

5. Gold or silver spittoons.

6. Water goblets of gold or silver, chased and niellated, or else worked in the Beder style.

7. Coffee- and teapots, of gold or silver, chased and niellated.

8. Various sorts of vessels: pateræ, salvers, trays, with or without lid, of gold or silver chased, niellated and enamelled or not.

9. Shears, knives, cutlasses, and other weapons, damascened or encrusted with gold, etc.

The plate, as well as some of the accessories and personal ornaments above referred to, may not, as a rule, in consequence of the sumptuary laws, be ornamented with polychrome enamels and jewels, or made of gold, except for the Court; or bear monochrome enamel, or be made in *vermeil* and gold, except for the high dignitaries of the State; or be made of silver-gilt and niellated except for minor personages. The rest of the population is allowed free choice between plain silver and *nāk* or red gold of six carats.[1]

Pieces of Art and sundry Implements.—Prominent among these are the statues and small figures of the Buddha and his disciples in multiform postures, as well as of deities from the Indū Olympus, cast in gold, silver, *nāk* (red gold), *samrit* (black bronze), and other metallic alloys.

Symptoms of decline have manifested themselves of late in this art, not only so far as the excellence of the alloys employed is concerned, but also as regards the skill displayed

[1] See for more particulars on such sumptuary laws my paper in the *Asiatic Quarterly Review* for October, 1900, p. 390, whence it will be seen that the wearing of gold chains was forbidden to the vulgar as early as A.D. 607.

in modelling them, which lags far behind that in the older specimens. This falling off is probably due to commercial causes, which demand an ever-increasing cheapness in the production of the artistic industries; but it is to be hoped that the progress pervading other branches of the local crafts will not fail to spread also to this one.

Of gongs mention has already been made; but outside the Lāu provinces some excellent ones are nowadays turned out in Southern Siam. Especially noteworthy are those which recur in a set or series, tuned to the native musical scale, in the instrument termed *khōng-wong*, or semicircular carillon, which forms part of orchestras (see p. 88 above). Often the gongs employed in temples or even for domestic purposes, are exquisitely engraved and ornamented, as may be argued from the drawing reproduced in No. 328 of this Exhibition (see p. 228 above).

With regard to bells, the same remarks hold good that have been made on the subject of statues. It should be noticed, *en passant*, that Siamese bells, being devoid of clapper, are rung in the same manner as gongs, that is by striking upon them with a sort of drumstick, or even with a deer horn. The little bells have, however, an iron clapper. Noteworthy, for their agreeable melodious ring, are those termed *kadüng*, which may be seen hanging from the eaves round the roofs of temples. They are gilt, and at the free end of the clapper is fixed a gilt heart-shaped plate in imitation of the leaf of the *bô*-tree (termed therefore *bai p'hô*), which, waved by the breeze, causes the clapper to swing till it gently strikes the inner surface of the bell, thus producing the sweet sound so characteristic of the sacred precincts. A number of such curious bells may be seen also hanging round the lower ends of the roofs of the present Siamese Pavilion.

Multiple lamp-sconces, candelabras, tripods, vessels, and other artistic implements of precious metals or of bronze are also made in Siam for use in the temples and sacred rites, as well as in domestic and State ceremonies. In this field of art the native talent and fancy are notably apparent in the clever representation of mythological serpents, monsters, and various

animals, as well as of floral motives, drawing their inspiration from the lotus [1] and from the luxuriant local vegetation.

Specially deserving of mention, however, is a characteristic tymbal, open at the bottom, made entirely of bronze, including the plane of percussion. This latter, instead of being constituted, as with us, by a tightened skin, is in Siam formed by a thin bronze plate corrugated all round in concentric circles. Towards the outer rim of this curious cover and at the limits of the four quadrants stand in relief as many figures of frogs, whence the vulgar designation of the tymbal as *klŏng kob*, meaning 'frog drum'. Its ritual name is, however, *mahôrathŭk* (*mahoradhika*), and the instrument is considered auspicious, as it has formed from a remote period an object of reverence among the primeval tribes of the country. Even nowadays it is highly prized, and along with the chank (*śaṅkha*) shells and other musical instruments of good omen, it enters into the composition of the ritual band which greets the King and ushers in with its strains the principal State ceremonies. The peculiar tymbal in question is at present almost exclusively manufactured by the Lāu and Karen tribes, and owing to the high esteem in which it is held it is not easily procurable by foreigners. The little frog figures which ornament it lead one to infer that the instrument must have been originally employed in rain-making rites. And the corrugated circular cover, on the rim of which the four batrachians are crouched, may well symbolize the surface—rippled by concentric wavelets—of the mysterious mountain lake *Nōng Kĕu* (the 'crystal' or 'jewel pond'), which, among the Lawā and other hill tribes of North-Western Siam, is believed to have been the cradle of their less evolved forbears who originated there as tadpoles, developing later into frogs, and lo! finally into men.

It would perhaps seem unfit to close this short review without some cursory mention of the considerable quantity of gold and other metals employed, not only in the leaf state, but also in plates of some thickness, for the gilding and roof-covering of

[1] As, for instance, in the three-branched chandelier terminating in spikes whereon to place scented sticks or wax tapers, which is termed *chongkon* from its being made in the shape of a *chongkon* or *chongkolanī* blossom, a small variety of white lotus.

temples, pagodas, and statues, and in wire form for the manufacture of luxurious carpets and mats. Suffice it to recall that the famous bronze statue of the Buddha which towered in the royal temple of the ancient capital Ayuddhyā, and was cast in A.D. 1500, being 16 metres in height and some 55 to 60 tons in weight, had been entirely covered with gold plates weighing in the total some 300 kilos. These were removed by the Burmese during their pillage of the capital when it fell into their hands in 1767. A like fate met the 200 kilos of gold plates which covered the central spire of the shrine surmounting the P'hraḥ Bāt, or facsimile of the Buddha's footprint, the gold plates which decked the interior of the same shrine, and the silver slabs with which it was paved. The roofs and spires of the Wihān Somdet throne-hall in Ayuddhyā were covered with gilt tin slabs; the throne in the Sanp'het audience hall was decked with nearly 200 kilos weight of gold of 24 carats fineness, and studded with gems; an immense wealth of statues, vessels, and artistic sacred apparel was lavished in the temples, which astounded foreign visitors.

Many a gilt temple and royal palace spire are still worthy of notice; in the interior of such buildings will be found a considerable amount of gorgeous decorations, furniture, and artistic vessels; but the masterpieces of the goldsmith and metal-founder are nevertheless invariably represented by cimelia of the good olden time, which have been brought thither as a result of repeated gleanings through the ruins of ancient monuments. The P'hraḥ Bāt shrine has been rebuilt and topped with a slender spire entirely gilt, while on the floor a mat woven of silver strips has been laid. But the former magnificence is not likely to be revived, nor perhaps would it be desirable; the nation needs and means to devote its revenue to the further development of the country, and of its industries and commerce.

Besides the gilding applied to statues and decorative parts of buildings, that upon the finials of certain monuments and temple spires is worth mention. In order to give an idea of the skill attained in the past by the Siamese in such a craft, it will be sufficient to say that the gilt finial surmounting

the P'hraḥ Prāng pagoda at Old Sawankhalôk, erected upwards of ten centuries ago, was still in 1896, when visited for the second time by the writer, as bright and shining in its golden casing as if it had been gilt but a few decades before.

As regards the manufacture of hammered copper wares, it never rose to a high artistic standing, nor was it carried on in the country to any considerable extent, being restricted to the production of domestic vessels. In the present Exhibition are some specimens of iron and copper vessels turned out by the convicts in the State prisons, which will afford an idea of the usual vessels manufactured now.

As far as precious metals are concerned, there is on view a small collection of chased silver vessels, including salvers, trays, pateræ, jugs, bowls, water goblets, etc., such as are ordinarily employed in middle-class families. A specimen is, moreover, exhibited, in the form of a silver-gilt bowl, of the Ligor niello wares.

CLASS 137

Knick-knackery, Bric-a-brac, Toys

General Remarks

Siamese knick-knacks mostly include ivory carvings, mother-of-pearl marquetry, matting, straw-plait and wicker-work, whether lacquered or not. Turtle shells and coral, though forming part of the local natural produce, are scarcely worked,[1] neither are horns, bones, and shells, those beautifully variegated sea shells excepted, which are simply fitted with a metal shank in order to transform them into buttons, referred to above (p. 125).

[1] Turpin in 1770 states (op. cit., p. 224) that ' Les Siamois font avec le gros de ces arbres [i.e. of coral] des couteaux & quelques autres petits ouvrages. Le corail est d'un fort beau noir lorsqu'il est travaillé '. At the Bangkok Centennial Exhibition of 1882 specimens of coral-work, such e.g. as knife handles, dagger hilts, etc., were to be seen. Some of these were carved out of a splendid white coral.

Doll and toy making are, on the contrary, highly developed industries. Such articles are mostly made either of baked clay or of pasteboard formed on a mould or mannikin by pasting in succession a number of single sheets of thin paper one upon another, so as to obtain a compact hollow figure, from the inside of which the mould is then pulled out. Also we have small figures of elephants and other gewgaws carved out of ebony or ivory, little wooden horses, and elaborately gilt and painted fish in imitation of the carp, made of palm-leaves and suspended from a string for the amusement of children.

No little ingenuity and skill are displayed by Siamese artisans in the manufacture of certain toys, as for instance, in making tiny and daintily decked figures representing local types and costumes, in carving out of soft wood (usually *Zalacca edulis*) life-like reproductions of snakes and lizards, and in turning out whole miniature scenes, mostly burlesque, of local life by means of mechanical puppets set in motion by clockwork. Not less proficiency do they evince in the preparation of little models of houses, boats, vehicles, and furniture, and in reproducing, in pith or stalks of squill (*Scilla maritima*) and fleshy leaves of various plants, figures of animals and other objects designed to serve as toys or for ornament.

Here we shall more particularly dwell upon plait-straw, wicker, and lacquer work, which, besides forming the object of extensive industries in Siam, are amply represented in the present Exhibition.

The wicker-work craft there embraces not only the manufacture of articles out of plaited straw, osiers, withes, etc., but also of far more durable and minutely elaborated products, in which the cuticle of the rattan and of the bamboo cane, cloven into thin strips, and certain fine leaves and grasses are employed. With the latter sun-hats are made which closely rival Panamas, and already find a ready sale on the European markets, and cigarette-cases, as well as other articles of fine workmanship. With the former, on the contrary, baskets, trays, salvers, tea-cosies, etc., are produced which, as may be judged from the specimens on view in the present Exhibition, are of a remarkable finish. These are representative of the wicker-work production

of Siamese convicts, and thus afford a glimpse of the professional teaching which is imparted in the local prisons.

With certain grasses, leaves, and rushes, matting of many sorts is made which serves a number of uses. Such mats range from the most common ones, employed in a similar manner to our tarpaulins, etc., as covers for boats, carts, and goods, or as sails for skiffs, to the finer kinds made to do duty as carpets for the floor,[1] and also for decking the walls of rooms. The coarser mats are woven by hand with bamboo laths or strips of Nibong palm-leaves (*Caryota urens*); and with rattan, lianas, or rushes split lengthwise. The finer and softer ones are, on the contrary, woven on special hand-looms with leaves of *Wrightia*, of *Maranta dichotoma*, and of several varieties of screw-pine (*Pandanus odoratissimus, furcatus, Hullettii*, etc.). If intended for sleeping mats they are made double; if to serve as carpets they are seldom allowed to retain their white or other natural colour, but the filaments are dyed in different tints and shades before weaving. By such a process polychrome mats are obtained of the most varied designs: striped, checked, flowered, or figured, and storied with reproductions of animals, mythical subjects, emblems, and inscriptions. In this branch of industry the provinces of Chantabūrn and Singora particularly excel, their production being deservedly famous, as may be argued from the specimens on view in the present Show.

Other provinces distinguish themselves for mats of other kinds, whether woven with leaves or grasses and cotton threads intermingled, or made to a different pattern. A collection of twenty-seven samples of the various patterns in use is presented under Nos. 856–82.

To mats and carpets woven with silver strips or wire reference has already been made (p. 238); it may here be said in addition that mats are sometimes woven with thin strips of ivory. Splendid specimens of both these kinds of manufactures could be seen at the Bāngkōk Centennial Exhibition of 1882.

[1] Mats to squat upon are mentioned as being already in use in Siam as early as A.D. 607 (see my paper in the *Asiatic Quarterly Review*, January, 1901, p. 163). Ma Huan in his account of Siam, 1408, says that on the floor 'they spread their *rattan* and *bamboo mats*, upon which they sit, sleep, rest, and eat' (see the Journal China Branch R.A.S., vol. xxi, p. 34, 1887).

Although not represented in this Show, none the less worthy of mention are some rough mats made of leaves of the *Pandanus Leman*, or of palm, stitched together and not interlaced nor woven, termed *kac'hëng* (from the Malay *kajang*), which are largely utilized as covers to protect goods in boats and carts from sun and rain, and also as curtains and hangings, and for the erection of temporary sheds and partitions. They are handy enough, light and cheap, and as they may easily be folded up and stored away when not in use they cause but little encumbrance.

A most important branch of the wicker-work industry in Siam is the one intent upon transforming, by the application of lacquer, articles made of osiers, rushes, etc. (such e.g. as salvers, covers, trays, baskets, and the like), into vessels impervious to liquids, just as if they were of wood or metal. To this craft reference has already been made above (pp. 77, etc.), but it will be worth while to dwell upon it here at greater length. The process consists in applying to the wicker articles alluded to—which in order to come out well must obviously be of a very fine texture—several successive coatings of the black varnish or lacquer termed *rāk*, already repeatedly mentioned in these pages. Each coating of lacquer is smoothed over well before the next one is applied; and the smoothing and re-lacquering are patiently repeated, even up to twenty times for the finest work. Then the article is polished with fine red sandstone, and the pattern with which it is wished to ornament it is drawn on the lacquered surface with a finely-pointed bodkin. The patterns adopted usually follow traditional models, and consist of straight lines running parallel or intersecting themselves so as to form squares, rhombs, and other rectilinear figures; of floral ornaments and undate or concentric lines. Vermilion or orpiment coloured lacquer is then rubbed into the pattern, and the work is finished off with another coat of lacquer and oil which is brought to a high polish.

In this manner cups, bowls, salvers, trays, boxes, etc., are obtained from the original wicker pieces, which serve for holding and carrying multifarious articles, such as betel leaves and areca-nuts, cigarettes, clothes, etc. Especially curious are the

circular polysynthetic boxes, which consist of a series of boxes of gradually diminishing size and fitting one into the other, all provided with their respective lids. Sets are made of six and more, which, when placed into one another, occupy no more room than the outer and largest one does.[1]

The West Lāu country, namely, the province of C'hīeng Mãi on the whole, and more particularly the town of Lamp'hūñ, which was formerly the capital (till A.D. 1281), held from an early period the foremost place in the manufacture of such lacquered wares. In fact, already in 1476 in the inscriptions set up at the Kalyāṇi Pagoda near Pegu town, mention is made of lacquered boxes imported from Lamp'hūñ into Pegu,[2] which is evidence that even outside of Siam such articles were then prized and sought after.

From the same province of C'hīeng Mãi come also the famous *talùms* (polygonal hampers or footed trays), circular trays and salvers, the *ô* (cups and bowls), all lacquered in a single or diversified colours. Sometimes the trays are inlaid with mother-of-pearl or encrusted, as in Lower Siam, with mosaic made of little bits of looking-glass, and serve especially to offer food and requisites to the Buddhist clergy, as the rules of the Order forbid the use of gold or silver plate, while those of civility deter the lay devotees from resorting to common wooden or brass vessels.

[1] Such boxes are locally termed *ĕb*. Another kind called *ab* is a large circular box for general household use, lacquered and hand-painted.

[2] It is stated in such inscriptions that King Rāmādhipati (*vulgo* Dhammacheti) of Pegu, when sending a mission (in 1475) of elder Buddhist monks, headed by Moggallāna, to Ceylon, gave them, for presenting to the Ceylonese clergy, among other things, 'twenty betel-boxes of motley colour manufactured in Haribhuñja' [the classical name of Lamp'hūñ], (*Cittavaṇṇāni Haribhuñjadēsiyāni vīsati-tambūla-pēṭakāni*). Further on it is added in the same petroglyphic records that the king referred to above presented his twenty-two clerical envoys with, among other things, 'twenty-two variegated Haribhuñja betel-boxes, with covers' (*Haribhuñjadēsiyaṇi sapidhanāni bāvīsati citratambūla-pēṭakāni*).

It should be noticed while on this subject that the lacquered boxes, trays, and bowls presented to the Buddhist clergy are usually red internally and black on the outside, but they are seldom ornamented with geometrical designs or floral motives. At the same time, in the text quoted above polychrome (*cittavaṇṇāni*) and variegated (*citrāni*) betel-boxes are evidently implied, though in the second instance the meaning may be simply 'lacquered' and coloured in a uniform manner (i.e. without designs).

Some specimens of Lāu lacquered trays and boxes figure in the present Exhibition, while an example of mother-of-pearl inlaid work and gold painting on a black lacquer ground is exhibited in the form of a little screen under No. 883.

In about 1675 Captain Bowrey, while on a visit to Achīn (North Sumatra), noticed that there were imported thither from Siam, among other things, 'Screetores [i.e. escritoires, writing-cases] both plaine and lackared.'[1] It is here a question of one of the varieties of the boxes referred to above, rectangular in form and manufactured in the province of C'hīeng Māi, or else of the mother-of-pearl inlaid ones of Lower Siam.[2]

Under No. 883*a* is presented a little model of the Siamese cradle, which, as will be noticed at first sight, substantially differs from the European one. It consists, in fact, of a trough-shaped frame partly of wood and partly of netting, suspended

[1] Thomas Bowrey's *Countries round the Bay of Bengal*, Cambridge, 1905, p. 290.

[2] Turpin speaks (op. cit., t. i, pp. 367-8) of mother-of-pearl inlaid work in Siam as a former industry, which may easily be understood, Siam having then just succeeded in freeing herself from the yoke of the Burmese, who had laid the country waste and destroyed the capital. Turpin adds furthermore some particulars of the local mother-of-pearl industry which are interesting to learn. I therefore reproduce the passage in full, italicizing the salient sentences: 'On trouve des perles dans les huîtres semblables à celles d'Europe, & l'on en tire la nacre de perle; les écailles entières sont le nacre. Les Siamois nettoient le dessus de l'huître avec du vinaigre ou du jus de limon, & scient ensuite cette écaille pour en faire différents ouvrages. Ils avaient fait au séminaire de St. Joseph [in Ayuddhyā] un crucifix fort beau, dont le corps et la tête du Christ étaient de nacre de perle d'une seule pièce; les bras & les jambes étaient de morceaux rapportés. *Les grands avaient autrefois chez eux quantité de petites boëtes, des écritoires, & des cannes couvertes de cette nacre, représentant plusieurs desseins de fleurs et de feuillages.*'

The following description of the letter dated January 28, 1699, dispatched by the King of Siam to Louis XIV of France, gives an idea not only of Siamese lacquer-work but also the work of the goldsmith and silversmith and the silk manufactures: 'Cette lettre est écrite avec un poinçon sur une feuille d'or et est dans une boëte d'or faite en cornet avec un couvercle façonné en pointe à la siamoise. La lettre et la boëte pèsent un marc et demy, moins environ demy once. La boëte d'or est dans un sac d'étoffe d'or et de soye, lié avec un cordon de soye rouge au bout duquel sont deux boutons de filigrane d'or, ce cordon est passé dans quinze petits annelets d'or attachez au sac. Le sac est dans un coussin garny de coton et d'étoffe de soye, blanc et or, et de taffetas aurore, ce qui couvre le coussinet s'attache avec trois petits boutons de filigrane d'or. Le tout est dans *un coffret de vernis rouge de Siam*, garni aux coins de plaques d'argent fort minces, avec une petite chaine aussy d'argent pour le tenir ouvert' (document dated October 13, 1719, in the archives of the Colonies in Paris, and quoted by Lanier in *Relations de la France et du Royaume de Siam*, Versailles, 1883, pp. 189-90, footnote).

by ropes to a cross-beam supported by two wooden pillars resting on the floor. In well-to-do families the whole is ornamented with carvings, inlaid work, and gildings; while in the poor ones both posts and cross-beam are altogether dispensed with, and the cradle is hung to one of the ceiling joists or girders. The cradle is, as may be understood, swung backwards and forwards, and not rocked as with us. It is very practical and adapted to the tropical climate, as its sides, being formed of netting, permit a free ventilation. If, as seems pretty certain, primitive man led an arboreal life, and his tender offspring was naturally rocked to sleep by the swinging branches, surely the Siamese type of cradle is the most rational and suitable one for children even at the present day.

G. E. Gerini.

Glass case in the middle of the Central Hall, containing dramatic masks and silver ware.

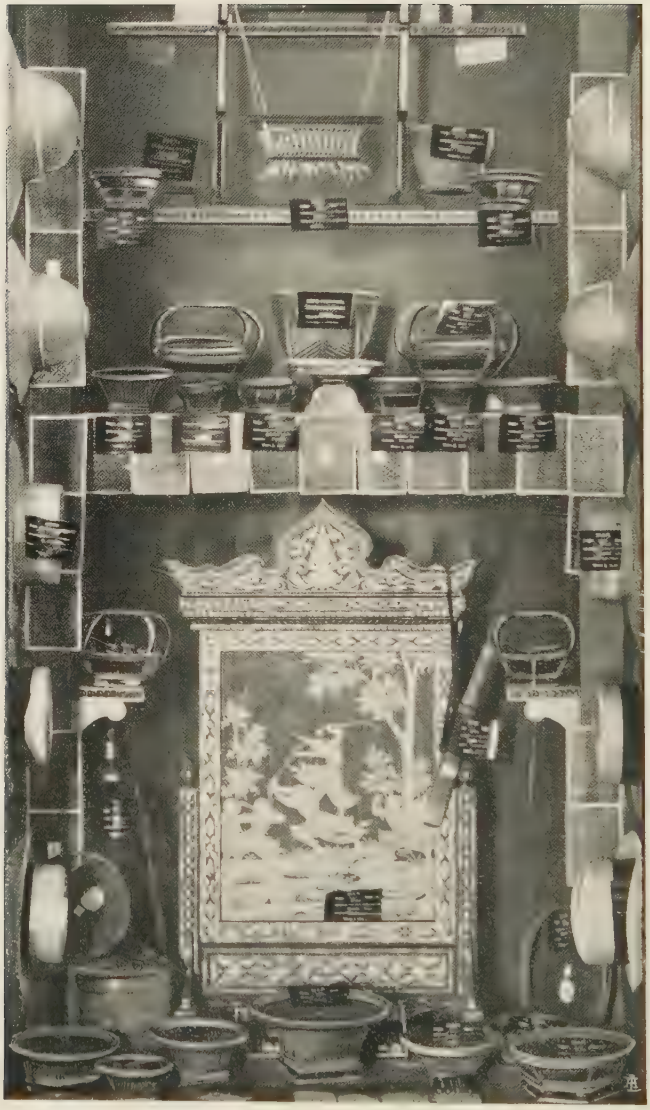
GROUP XXI

Precious Stones and Metals, Knick-knackery, etc.

Serial No.	Exhibitor.	Description of Exhibits.
	Class 135. Silver Wares, artistic Bronze Articles, etc.	
778	The Royal Prison Department	Brass water bowl and stand.
779	.. ..	.. .. ..
780	.. ..	.. .. ..
781	.. ..	Buddhist monk's alms-bowl of wrought iron with mother-of-pearl inlaid cover and stand.
782	.. ..	Miniature ditto for ornament.
783	The Royal Commission for Foreign Exhibitions	Chased silver goblet (52 ticals weight).
784*a*, *b*	.. ..	One pair large chaliced silver vases for flowers (104 ticals weight).
785	.. ..	Silver dish with tripod serpent stand (162 ticals weight).
786	.. ..	Silver casket (255 ticals weight).
787	.. ..	Silver tray with four-footed serpent stand (109·25 ticals weight).
788	.. ..	Silver goblet, plain (147 ticals weight).
789	.. ..	Ditto, chased (145 ticals weight).
789*a*	Tamagno, M., architect	Chased silver tray and stand with figures in relief.
789*b*	.. ..	Silver-gilt bowl, niellated in the style of Ligor.
789*c*	.. ..	Silver-gilt vase, ditto.

Serial No.	Exhibitor.	Description of Exhibits.
	Class 137. Wicker-work, etc.	
790–800	Singora, Province of	Mats (11) of various patterns in colour.
801–8	,, ,,	,, (8), figured with animal designs.
809–10	,, ,,	,, (2), striped.
811–12	,, ,,	,, (2), striped.
813–16	,, ,,	,, (4), monochrome.
817–21	,, ,,	,, (5), figured with emblems, etc.
822	,, ,,	,, (1), variegated.
823–5	Chanthabūrṇ ,,	,, (3), figured.
826–8	,, ,,	,, (3), checked and plain.
829	Nakhōn Sawan, Province of	,, (1), with ornamental pattern of red cotton thread.
830–2	Nagara Rājasīmā, Province of	,, (3), common, large.
833–6	,, ,,	,, (4), common, middle-sized.
837–9	,, ,,	,, (3), small size.
840–1	Ayuddhyā, Province of	Straw hats (2), helmet-shaped.
842–5	,, ,,	,, (4), of various shapes.
846 846*a*, *b* 847 847*a*, *b*	,, ,,	,, (6), Panama style.
848–55	Nakhōn Ch'haiśrī, Province of	Cigar-cases (8) of plaited filaments.
856–82	The Royal Prison Department	Sample mat-work of twenty-seven different patterns.
883	,, ,,	One panel of gold and lacquer work.
884	,, ,,	One bamboo cane stand.
885–6	,, ,,	Baskets (2), large, hexagonal shape.
887	,, ,,	,, (1), middle, ,,
888–91	,, ,,	,, (4), oval, with cover and handle.

Serial No.	Exhibitor.	Description of Exhibits.
892-3	The Royal Prison Department	Baskets (2), large, square-footed, with cover.
894-7	,, ,,	,, (4), middle, ditto, ditto.
898-900	,, ,,	,, (3), small, ditto, ditto.
901-3	,, ,,	,, (3), small, square-footed.
904	,, ,,	,, (1), small, octagonal foot.
905-6	,, ,,	,, (2), small, square-footed.
907	,, ,,	,, (1), large, ,,
908-9	,, ,,	,, (2), middle, ,,
910	,, ,,	Tray (1), large.
911	,, ,,	,, (1), middle.
912	,, ,,	Teapot basket.
913	Nakhōn Sawan, Province of	Lāu sword.
914	,, ,,	Lāu dagger.
914*a*	Tamagno, Mrs. M.	Model of Siamese cradle.



Wicker- and Lacquer-work Exhibits, Class 137
(see pp. 248-9).

GROUP XXII

Leather and similar Industries

CLASS 138

Tanning

General Notes

THE art of tanning has only been carried on in Siam for a little more than a century. La Loubère, who visited the country in 1687, wrote that the industry was quite unknown in his time.[1] On the other hand, Finlayson states in 1822 that in Bāngkōk the preparation of leather was carried on to a great extent, but by Chinese, 'for covering mattresses and pillows and for exportation to China.'[2] Captain Low, writing of C'hīeng Māi in 1825, observes: 'In the preparation of leather, the skins are first exposed to the action of lime-water, then beaten, and dressed by an infusion of *sapang* [sapan-wood].'[3] This evidences that tanning was practised in the Lāu Country. As regards Siam proper it is only of late that the Siamese have begun to apply themselves to it.

The tanning substances employed are exclusively of vegetal origin. Among these the first place is held by the *palông* or mangrove bark (*Rhizophora mangle*), a tree growing plentifully

[1] Op. cit., p. 70.

[2] *Mission to Siam and Hué*, London, 1826, p. 214. Shoes, he says, were then but scarcely used. The Siamese, in fact, have been always more accustomed to wear sandals, especially in the upper and hilly parts of the country. Such sandals, even to this day employed in the jungle and hill-tracts, are made of untanned leather, being kept in position by two thongs which run from the two sides of the sole and unite in the front, passing between the great and second toes.

[3] Journal R.A.S., 1839, p. 256.

in and about sea lagoons or in the neighbourhood of the mouths of rivers. The *sī-sīet* or cutch (*Nauclea gambier*) bark is also employed, and that of the *dëng chik* (*Barringtonia acutangula*), as well as nuts of the emblic myrabolan (*Phyllanthus emblica*), which also contain much tannin.

In the present Show are exhibited samples of mangrove bark, which is the most widely employed (Nos. 923–5). In another group (Class 122, No. 605) may be seen a specimen of leather tanned with such substance; while, from the note following below, the reader may form an idea as to the method employed. The leather tanned in this manner acquires, through the colouring matter contained in the said bark, a brick-red colour.

The collection of exhibits in this class is completed with some deer-skins and buffalo-hides, and with some horns of the latter animal.

The curing of skins with the hair on is still too little practised in Siam. This is much to be regretted in view of the large quantity of valuable pelts (tiger, leopard, bear, black panther, crocodile, python, etc.) which for this reason are lost. It is to be hoped that in this craft, as well as in those of tanning and currying, in which much may yet be done, a greater development will take place, and prove of material benefit to the country.

G. E. Gerini.

Directions for Tanning with Mangrove Bark

Soak the raw skin or hide (of ox or buffalo) in lime-water for about three days. At the end of this period take it out and stretch it on a table, scraping the hair from it by means of a sharp knife; then rinse in running water.

Pound mangrove bark to a fine powder and besprinkle it all over the hide which is to be dressed; then dip this into a vat half-filled with water to which a convenient quantity of powdered mangrove bark has been added. Leave to soak for three days. Now remove the hide, stretch it over a table or keep it distended by means of bamboo reeds or sticks, and put it in the sun to dry. When thoroughly dry the leather is ready for use.

L. C. Teck.

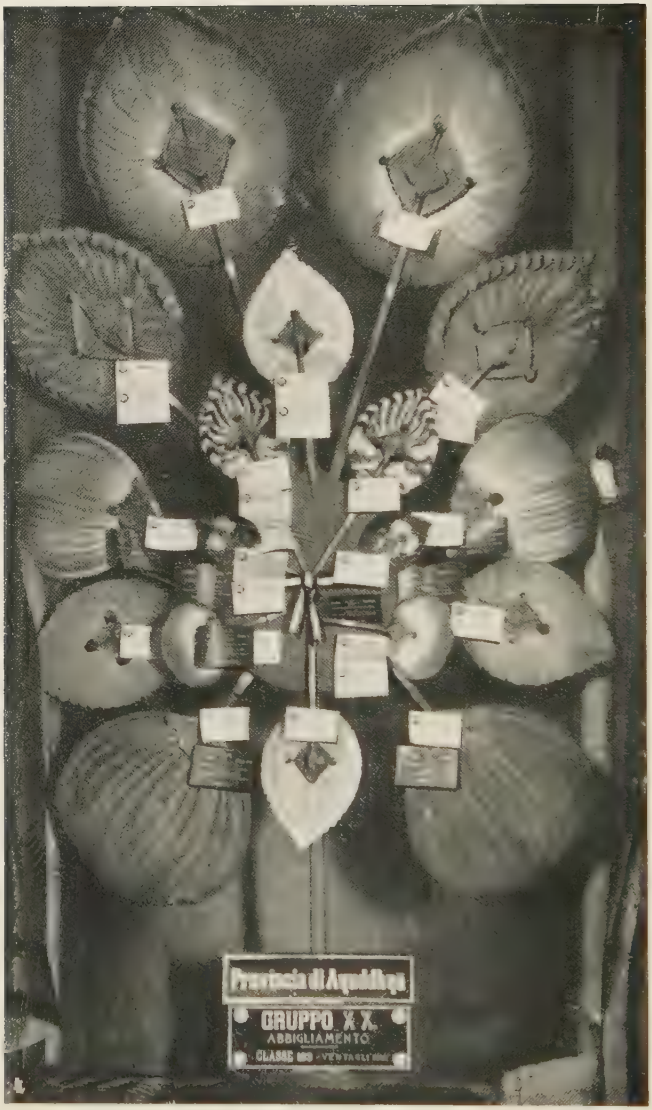
GROUP XXII

Leather Industry

CLASS 138

Tanning Materials, Hides, etc.

Serial No.	Exhibitor.	Description of Exhibits.
915	Royal Customs Department, Bāngkōk	Pair of buffalo-horns.
916	,, ,,	,, ,,
917–19	,, ,,	Deer-skins (3).
920	,, ,,	Skin of *rusa* or *sambhur* (*Cervus unicolor*).
921–2	,, ,,	Buffalo-hides (2).
923–4	,, ,,	Mangrove bark (*Rhizophora mangle*) for tanning (2 bundles).
925	Teck, L. C., Bāngkōk	,, ,, ,,



Siamese Fans exhibited by the Province of Ayuddhyā
(see p. 227).

GROUP XXIII

The Art of Printing

Retrospective Notes

If one pauses to think of the active and continuous intercourse which existed between Siam and Europe since the beginning of the sixteenth century, one cannot but be struck by the fact, as strange as it is incomprehensible, namely, that amongst so many useful inventions of modern Western civilization, which by degrees were introduced into the country by diplomatic envoys, missionaries, and merchants, the art of printing was not made known and established there until quite late in the day. At the outset of that intercourse the compass and other nautical instruments were imported into Siam; in the seventeenth century clocks, watches, and various other mechanical contrivances, telescopes, and a large amount of scientific apparatus, as well as numerous works printed in Europe, were brought there; but it never occurred to anyone to introduce the art of printing, even with the aid of Roman characters. Thus also the eighteenth century went by, and it was not till the next was well advanced that this efficient instrument of civilization and progress made its appearance in Siam.

The merit of this noble initiative belongs to the American missionaries. It was Dr. D. B. Bradley, of the American Board of Commissioners for Foreign Missions, who, having reached Bāngkōk in July, 1835, landed there a small old-fashioned press, made of wood and stone, together with a good supply of Siamese and European metallic types which he had brought from Singapore.

These Siamese types, however, were far from being brand-new. Cast in Calcutta from matrices prepared there under the superintendence of Dr. Marshman, they had already served for the purpose of printing the Siamese grammar by Captain Low in 1828,[1] the first publication that appeared in Siamese types. Subsequently conveyed from Calcutta to Singapore, they were employed to print a religious tract by C. Gutzlaff (1831), some translations of the Gospel of St. John (1832) and St. Luke (1834) from the same pen, and finally another tract and the Gospel of St. Matthew, translated by J. T. Jones (1835). These were the first works printed entirely in Siamese characters.

The same types, having been bought by the American Board of Commissioners for Foreign Missions, were brought into Siam by Dr. Bradley, as has been mentioned above. Here ended their wanderings, but not their career. With all their æsthetic and organic defects—and they were not few—they served honourably till 1841, when the Mission was able to establish a type-foundry, and new matrices that would yield better-looking types were made in 1846 by J. H. Chandler, an able type-founder of the American Baptist Mission.

On June 3, 1836—a date which must remain memorable in the history of the progress of Siam—the first printed publication made its appearance in the country, thanks to the collection of types and the small printing-press already described. It was a simple religious tract in the Siamese language. But soon the primitive press was replaced by a more powerful and better constructed one, and this began its toiling work on October 25, 1836, pouring forth uninterruptedly heaps of printed paper.

Missionary Malcolm, who was in Bāngkōk on a visit of inspection to the American Missions in June and July, 1837, says that during the year 1836–7 13,124 books containing 1,439,720 pages were published, comprising besides religious works small educational treatises such as *First Lessons in English and Siamese*, *Lessons in Arithmetic*, and *Lessons in English*.[2]

[1] *Grammar of the Thai or Siamese Language*, by Capt. James Low, Calcutta; printed at the Baptist Mission Press, 1828.

[2] H. Malcolm, *Travels in South-Eastern Asia*, vol. ii, p. 156, London, 1839.

Prince Mongkuṭ, the most enlightened and broad-minded personage living in Siam at that period—then in Holy Orders in a Buddhist monastery,[1] which he made the intellectual workshop wherein to prepare that regeneration of the country which he initiated afterwards during his reign—was, as can be well imagined, the first Siamese to avail himself of the new art introduced into the land, clearly recognizing the immense benefit it would render to the cause of progress. He at once had a printing-press installed in his convent, where, not being able to immediately procure Siamese types, he for a time made use of types which were obtained for him from Italy by local Catholic missionaries, printing in Romanized Siamese with them. As to the press, he had it built on the premises under his own directions.[2] This was the first printing-office ever established and operated by Siamese, and it started work in 1836. Ten years afterwards it was already equipped with two distinct founts of Siamese type, another similar one adapted for the Pāli language, and two small ones of Latin characters. There were printed, for the most part, sacred Buddhist texts in the Pāli language.[3] In 1847 a fount of Ariyaka characters was added, under the superintendence of the selfsame priest-prince, who had it prepared so as to facilitate the printing of Pāli texts.[4] Thus it came to pass that the

[1] Wat Pavaranivēs.

[2] Malcolm learned this fact in 1837. See op. cit., vol. ii, p. 154, where he writes as follows: 'Chow Fah Yai [i.e. Prince Mongkuṭ], eldest legitimate son of the late King, and who retired to a convent rather than contend for the throne, has not only written, but printed, Siamese in our letters. He has a press made by himself, and types, most of which, probably, were obtained from Italy, through the Catholic priests. It is certainly of great consequence to follow up this beginning.'

[3] So says the *Bangkok Calendar* for 1847, reprinted in the *Siam Repository*, 1869, p. 324. The textual entry is as follows: 'Press of His Royal Highness Chau Fa Yai [i.e. Prince Mongkuṭ]. This office contains one Press, one Font of Siamese, two of Pali, and two small Fonts of English. This is the first Press set up by Siamese.'

[4] See the *Bangkok Calendar* for 1848 (reprinted in op. cit., p. 329). The textual entry is as follows: 'Press of His Royal Highness T.Y. [i.e. Thūn Kramōm Yāi] Chaufa Mongkut. This office contains one Press, one font of Siamese, two of Pali, and two of English. It is mostly employed in printing works in the Pali language. His Royal Highness has prepared a new character for the Pali which is called Ariyk [read *Ariyaka*]. The K'om [*Khōm*] or Cambojan character is generally used to write the Pali in Siam. To make

Prince (afterwards King) Mongkuṭ was the first Siamese to set an example to his countrymen by introducing the art of printing, just as he was the first to demonstrate its benefits in the cause of progress with his own publications and with articles contributed to local and foreign periodicals.[1] He was a true and great ethical, political, and religious reformer, and remained so during the whole of his life.

His noble example was soon followed by the most advanced of the Siamese. Even as early as 1837 the then Minister for Foreign Affairs, Prayūrawongse, desirous of printing works in the national literature, had tried, though with little success, to make a fount of Siamese type. Far better results were obtained not long afterwards by the very talented mechanic Môt (who became later on P'hyā Kraṣāp or Superintendent of the Royal Mint). This gentleman, having established a mechanics' shop in 1848, was able to turn out creditable electrotype work; later on he installed therein machinery and typographical apparatus with which, in 1850, he printed the first volume of the Laws of Siam, in an edition of 500 copies. This was too bold a departure for the reactionary regime which then prevailed, and hostility was directed against the innovators. The publication of the laws, annals, and other political literature was strictly prohibited, as access to them was to remain a privilege of the chosen few who exercised the administrative and judiciary powers. So the edition was seized by an order from high quarters, and the efforts of the talented mechanic met with a temporary check. But the hour of rescue was impending and was ushered in by the advent to the throne of the liberal Prince Mongkut, in whose reign, as in that of his not less liberal successor, the printing of books and periodicals attained its greatest diffusion.

Meanwhile, the Government of the preceding reign, although very conservative, had not been able to remain indifferent to the advantage of printing for the spreading of news and

a font of K'om would require about *one thousand* matrices; but it requires only *forty-one* for a font of Ariyk.'

[1] The *Bangkok Calendar* for 1850 contained articles in English on the eclipses that he had calculated himself for that year, on the rectification of the Lunar-Solar calendar, and on other important subjects.

decrees, and so early as 1839 it had been induced to have a Royal proclamation printed contrabanding the importation of opium. This decree, issued in 9,000 copies on April 27, 1839, by the American Mission Printing Office, was the first State document printed in Siam. On January 13, 1843, the same printing-office published in Siamese the first almanac printed in the country, and a short time afterwards a small treatise on astronomy in the same language.

But much more memorable is the date of July 4, 1844, which marks the birth of journalism in Siam. On that day the first newspaper ever printed in the country, the *Bangkok Recorder*, appeared in two simultaneous editions, one in English and the other in Siamese. Both were monthlies, edited and printed by Dr. Bradley in his own establishment. The more important of the two, however, from the standpoint of history, was the Siamese edition, to which, anonymously, the most enlightened Siamese contributed articles, discussing those new ideas that prepared the way for the political and economic regeneration of the country which was realized during the two following reigns. Printing-offices and newspapers soon multiplied, as well as books of all kinds, whether of classical or of popular scientific literature, most of which were in Siamese. It would take too long to give here in detail the history of the remarkable revolution achieved by the Press during the sixty years that have since elapsed. It coincides with the history of the progress of the country. Suffice it to mention that if in Bāngkōk in 1872 already six printing-offices existed, of which one belonged to the Government, they are now quadrupled in number and turn out an immense amount of books and newspapers. A Peguan printing-office was set up two years ago at Pāk-lat, a small town further downstream than Bāngkōk, which issues religious and literary works in that tongue; and a Lāu printing-office has been at work for years at C'hīeng-Māi, from which, besides books in the Lāu tongue and characters, a newspaper in the same language is also published.

Among the bulkiest and most important works issued by Siamese printing-offices, it will be sufficient to record the famous

edition of the *Tripiṭaka*[1] (Buddhist Holy Scriptures) in the Pāli language, published under the auspices of the lamented King Chuḷālongkorṇ in thirty-nine volumes, comprising in all 15,749 pages, in 1893, on the occasion of the silver jubilee of his reign.

Nor was there a lack of lithographed publications. The earliest and at the same time most bulky of these was the philosophic popular treatise named *Kicchānukit* and published by Chāu P'hyā Divākaravaṁsa, Minister of Foreign Affairs.[2] Printed with his own press, in 200 copies of 300 octavo pages each, it appeared on November 23, 1867. It is a work that—for its free and unprejudiced discussion of the essence and principles of Buddhism in comparison with other creeds, which in a marked modernistic spirit it attempts to harmonize with science, condemning its later patristic accretions and exposing the old superstitions—became very popular and contributed much towards the intellectual elevation of the past generation, while at the same time it prepared the spiritual leaven for the present one.

The publication of translations of foreign literary, historical, and scientific works, and even more of textbooks for the schools, imparted, during the last twenty years, a vigorous impulse to printing, to which contributed also the establishment of numerous newspapers, magazines, and other periodical publications, whether of a literary or an educational character, for the diffusion of modern knowledge. And along with other industries, that of printing was also introduced in the prisons to serve as an educational factor, and it is now practised there with skill and advantage.

It is greatly to the credit of Siam that it has, since its rise to the position of a modern nation, realized the benefits and the high mission of the Press so fully as to refrain from imposing any restrictions on it beyond those customary in other

[1] R. Chalmers thus speaks of it in the J.R.A.S. (London, January, 1898, p. 10): 'In Pāli scholarship the edition will always remain a great landmark on the path of progress, and an enduring monument - alike in Europe and Siam—to the Buddhist king who conceived and executed so excellent an undertaking.'

[2] Until January 29, 1868, on which date he was obliged to retire as his sight was almost totally gone, which procured him the popular nickname of *Kromatha Ta Mūt* (the Dim-sighted Minister of Foreign Affairs).

modern States. If in the craving for innovation and reform some book or newspaper seemed, to the conservatives of the time, a little too bold, so as to deserve seizure or suppression, this was never more than a passing incident, a temporary tightening of the bridle, after which the Press, and with it the propagation of new ideas, resumed its career. Thus the Press won for itself a pre-eminent place in the social life of Siam, and there enjoys, one may say, the same freedom as in the most advanced States.

Statistical Notes

About twenty-five printing-offices exist to-day in Siam, three-quarters of which are exclusively owned and worked by natives. Of these latter, six are attached to Government Departments, one to the Buddhist seminary, and one has its seat in the principal penitentiary. The works they turn out are printed, as a rule, in the Siamese, Lāu, Peguan or Mōñ, Pāli, English, and French languages. In the Catholic Mission Press sometimes also Latin is printed. Of all works issued by the printing-offices owned by the Siamese, two copies must be deposited in the National Library. Ten years ago a copyright law was enacted.

The periodical Press publishes in the capital three daily papers in two languages, namely English and Siamese, of which a separate weekly edition is issued in each language for dispatch abroad; a dozen magazines and weekly or monthly periodicals in Siamese exclusively, except one which is published in Lāu at C'hīeng-Māi, all mostly of an educational or literary character; and a trilingual magazine of Oriental studies (Journal of the Siam Society) which appears in parts two or three times a year. Furthermore, two guide-books (*Directory for Bangkok and Siam* and *Siam Directory*) are published annually in English and various calendars in Siamese. The actual illustrated newspaper is still wanting, although woodcuts, photogravures, and other illustrations appear occasionally in some of the above-mentioned magazines.

One may form an idea of the educational publications in Siamese from the textbooks used in the Government schools (exhibited in Group I, Nos. 177–202), whilst in the present group will be found recent numbers of the daily papers published at Bāngkōk and an annual directory.

G. E. Gerini.

CLASS 144

Paper

General Notes

Already about the year 1430 Nicolò Conti, while travelling through the north of the Indo-Chinese Peninsula, remarked: 'There is also a tree called *Tal*[1] which has large leaves upon which they write, for throughout all India paper is not used and cannot be found except in the city of Cambaia.'[2] But Ludwig Barthema says of Tenasserim, which he visited in 1504, when it was a Siamese province: 'Their writing is [done] upon paper like ours, and not upon leaves of trees as in Calcutta.'[3]

Both the materials mentioned were, and are in fact still, employed in Siam. The leaves of the talipot palm or ollahs are cut up into strips called *bai lān*, and the writing is done with a style. Paper made of bark, however, is also used, which is left white or blackened. On the white one writes with China ink and a pen made from a bamboo splinter, pointed and slit at the tip; and on the black writing is done both with steatite or white chalk pencils,[4] or with a bamboo pen as above dipped in a golden yellow ink which is prepared

[1] *Tāl*, *Tāla*, or the talipot palm, botanically *Corypha umbraculifera*.

[2] Voyage of Nicolò di Conti, in Ramusio's *Delle Navigationi et Viaggi*, vol. i, f. 340 verso, Venice, 1563.

[3] Itinerary of Ludwig Barthema in op. cit., f. 165 recto.

[4] This, as well as other processes of writing, was no doubt imported from India. 'Abdu-r-Razzāk noticed its employment in 1443 at Bijanagar (*Vijayanagara*) in Southern India, of which he wrote: '. . . they blacken a white surface, they then take a soft stone, which they cut like a *kalam* [reed-pen], and which they use to form the letters; this stone leaves on the black surface a white colour, which lasts a very long time, and this kind of writing is held in high estimation' (Major's *India in the Fifteenth Century*, London, Hakl. Soc., 1857, pt. i, p. 25).

with gamboge, and in certain cases with orpiment diluted in sap from the *Feronia elephantum* tree. Books of ollahs or palm-leaves are mere fascicles called *p'hūk*, consisting as a rule of twenty-four leaves (or, if double, of forty-eight), bored and strung together with a thin cord which is tied round on the outside of the fascicle. To make the writing more readable it is rubbed with a mixture of lamp-black. The leaves, especially if they are religious books, as is almost always the case, are gilt at the edges.

On the other hand, the books made of bark paper are folded like a screen and are called *samud*. They consist of twelve or twenty-four folds (double sheets) and even more. Sometimes they are provided with a cover consisting of two tablets polished, lacquered, and occasionally even gilt, fastened to the front and back leaves of the book. Similar tablets are also used for books made of palm-leaves, especially when they are works consisting of several fascicles. Moreover, such books are often wrapped in a piece of rich silk or brocade.

Besides the materials referred to above, cotton stuff upon which writing was done with China ink was employed till a century ago in the north of Siam, especially in the East Lāu country. To this very day rolls of MSS. on such material exist, containing especially grants and patents, called *kong din*. The Lāu name for the cotton cloth MSS. themselves is *p'hün lāi* (lit. 'variegated surface' or 'leaves').

For Royal letters to other potentates, however, for diplomas conferring high dignities, and for epigraphic documents enshrined in funeral monuments, golden leaves or plates were employed on which the writing was done by means of a style; sometimes vermilion pigment was rubbed into the letters in order to make them more distinct. The plate was then rolled and enclosed in a casket.[1] This practice is recorded in Siam from the seventh century A.D.[2]

[1] See above, p. 244, note 2, and La Loubère, who says (op. cit., p. 70): 'As often as the King of Siam writes to another King, he does it upon a Leaf of that Metal [v.l. gold] as thin as a Leaf of Paper. The letters are imprinted thereon with a blunt Poinson or Bodkin, like those which we write in our Table Books.'

[2] See my article in the *Asiatic Quarterly Review* for January, 1901, p. 162, note at foot of page.

The paper made of bark is the only one of the above-named materials which is requisitioned in printing, and even this is limited to fancy jobwork, such as invitation cards, menu-cards, and the like, for its thickness does not permit its use in publications of larger bulk, nor for newspapers, and still less for books. For such purposes paper of European manufacture is resorted to. Still, as a curiosity in this Show, are exhibited two blank books made of such bark paper folded like screens, which are little by little falling into disuse and will soon become relics fit for an antiquary's museum. One of the blank books is made of white and the other of blackened paper.

An examination of this sort of paper should prove interesting, for the material employed in its preparation is quite original to Siam and comes from the bark of an indigenous tree called *khōi*, in botany known as *Streblus asper* or *Trophis aspera*. A specimen piece of the trunk of one of these trees, together with its bark, is exhibited in Group XV (No. 369), and it is not improbable that modern industry may find out how to turn its bark to more profitable use. Meanwhile honour is due to the ancient Siamese industry for having found the method of utilizing it in the manufacture of paper. If the process of paper-making were learned from China, which in such craft has taught the whole world, neither from her nor from nearer nations did Siam learn to utilize the bark of the *Streblus*, since for the same purpose the *Broussonetia papyrifera*, a kind of mulberry, was employed in China and Burma, to which Marco Polo alludes.[1]

The origin of such an industry in Siam certainly goes back to a pretty ancient period, and it is probable that it is just to this kind of paper that Barthema, in 1504, alludes, as has been seen above.[2] Notwithstanding this, La Loubère, who was in

[1] He relates, in fact, of the Grand Khan: 'He makes them take of the bark of a certain tree; in fact of the Mulberry Tree . . . What they take is a certain fine white bast or skin which lies between the wood of the tree and the thick outer bark, and this they make into something resembling sheets of paper, but black' (M. Polo, Yule, 3rd edition, vol. i, p. 423, London, 1903). It appears from this that the paper was blackened as in Siam.

[2] In the description of Kamboja by the Chinese ambassador who visited it in 1296-7, it is said that the people there wrote on skins dyed black: 'Les écrits

Siam in 1687, says that besides the bark of the *khōi*-tree paper was made there also from old cotton rags.[1]

The process of manufacturing paper, or rather cardboard, from the bark of *khōi* or *Streblus* is generally the following:—

The branches of this shrub (which generally does not exceed 10 metres in height and half a metre in girth) are cut down and soaked in water for a few days, after which they are stripped of their bark. Then the cuticle or outer layer of this is separated and used preferably for the manufacture of black paper. From the liber or inner fibrous layer is prepared solely the white paper. Each part of the bark is then soaked for a few days in jars containing lime-water. After that it is removed, washed until all trace of lime has disappeared, and pounded with a wooden mallet, reducing it to a homogeneous pulp. This is diluted with water, and then poured little by little into rectangular frames of about 2 by 0·4 metres, with canvas bottom, which are kept immersed for about one-half in a large tank full of

ordinaires, tout comme les textes officiels, s'écrivent sur les peaux de cerfs, daims, et autres teintes en noir . . . Ils se servent d'une poudre ressemblant à la terre blanche de Chine et la moulent en bâtonnets appelés *Suo* [i.e. the white chalk pencils called to this day *Din Sō* in Siam]. Tenant en main ce bâtonnet ils écrivent sur le parchemin des caractères qui ne s'effacent pas . . . Si on frotte avec quelque chose d'humide, ils s'effacent' (*Bulletin de l'École Française d'Extrême Orient*, vol. ii, p. 158).

The eunuch Hwang Hsing-ts'êng wrote of Champā in 1520: 'Their writing is formed by painting in white upon skins.—*Obs.* They use sheepskins pounded to a state of thinness, or the bark of trees scorched black, upon which they write with pencils made of thin strips of bamboo folded together and tapering to a point. These they dip in a white pigment to write with' (*China Review*, vol. iii, p. 323).

Although it seems that some sort of parchment has long been used in Siam—as the Siamese name *náng-sŭ*, and more clearly the Kambojan *sbĕk-klā* (lit. 'tiger-skin' or 'striped skin') for 'writing' or 'written document' would imply—it is none the less certain that imitation parchment made from bark was early substituted for it.

[1] 'The Siamese make Paper of old Cotton rags, and likewise of the bark of a tree named *Ton-cci* [i.e. *tòn khōi*], which they pound as they do the old rags: but these Papers have a great deal less Equality, Body, and Whiteness than ours. The Siamese cease not to write thereon with China Ink. Yet most frequently they black them, which renders them smoother, and gives them a greater body; and then they write thereon with a kind of Crayon, which is made only of a clayish Earth dry'd in the Sun. . . . Besides this they write with a Stiletto and the Leaves of a Tree resembling the Palm: this Tree they call *Tan* [read *Lān*], and these Leaves *Bailan* [*Bai Lān*]; they cut them in a very long and narrow Square, and on these Tables are writ the Tables and Prayers . . .' (op. cit., p. 12).

water. During the immersion the pulp is stirred and spread uniformly on the canvas at the bottom of the frame. Then this is taken out of the tank, leaving the excess of the liquid to drain off. After a while a wooden roller is passed over the layer of pulp so as to make the paste more compact and press all the remaining water out. Then the frame with its contents is put in the sun to dry. One day is sufficient, if the weather is fine, to convert the layer of paste into a sheet of paper (or rather tough kind of cardboard), which is then detached from the frame by means of a wooden spatula. The sheet is finished off by applying to it a coating of rice size, which is polished with a smooth stone.

If black paper is required, a mixture of glutinous rice boiled with finely powdered charcoal from the *Æschynomene aspera* is applied to both faces of the sheet, after which the same is polished as explained above.

The sheet of paper thus obtained is afterwards folded in the shape of a screen, thus forming a blank book after the native style. Sometimes the outer face or cover of the book is varnished with oleo-resin from the *Dipterocarpus* tree. For more voluminous books two or more sheets are glued together lengthwise. The usual dimensions of a blank book when folded are 0·12 metre in width by 0·38 metre in length, but far larger ones are at times made. The price varies from 0·25 to 4 francs, according to size, bulk, and quality of the paper.

A similar method of paper-making in Siam is explained in the note which follows below.

G. E. Gerini.

Note on Paper-making in Siam

The paper is made from the bark of the *khōi*-tree (*Streblus aspera*), which grows wild in Upper Siam, and from there is brought down to Bāngkōk. The bark is first dipped into a strong solution of lime and allowed to drain, exposed to the air; is then steamed for twenty-four hours and the soft fibre collected in jars; from them it is taken out and beaten to pulp

by mallets on a flat board; when completely pulped it is made into balls, each about the size of a cricket ball.

The paper-maker takes one of these balls and places it in a bucket made of woven bamboo, which he dips full of water and stirs up the pulp with his hand. This work is generally done on the edge of a stream or pond. He then floats in front of him a wooden tray, the bottom of which is coarse canvas. By a dexterous movement he pours the bucket of liquid pulp into the tray, so as to cover it evenly with pulp; he then lifts out the tray, drains it, and presses the superfluous water out of the pulp with a bamboo roller.

The pulp adheres to the canvas, and the tray is set up on end and allowed to dry for twenty-four hours. The paper is then stripped off, covered with fine rice starch, polished with a smooth stone, and made into long folded books.

Should the paper be required to have a smooth black surface the starch is mixed with fine charcoal made from the *Æschynomene aspera*; the paste is then spread over the rough paper and polished.

W. F. Lloyd.

CLASS 157

The Pictorial Postcard

Owing to chromolithography in Siam being as yet in the initial stages, the picture postcards of the country are still for the most part printed abroad, with the double advantage of greater cheapness and better workmanship. The exhibit of this class here merely limits itself, therefore, to a series of large-sized original sketches for picture postcards from the pencil and brush of a distinguished painter, Professor Cæsar Ferro, who, during the three years in which he resided in Siam (1904–7) in the Government service, where he achieved a remarkable success, honouring both his art and country, had the opportunity of making numerous sketches of places and local life. These, with his kind consent, appear in this exhibit.

of which they form one of the chief attractions, giving at the same time an exact idea of the most characteristic architectural and ethnographical features of the country, as yet so little known to us.[1]

G. E. Gerini.

[1] Professor C. Ferro is not the first Italian painter who has been to Siam in the service of that Government. He was preceded in 1892 by Mr. G. Turchi, of Rome, who was called there at the same time as Mr. Troschel, a sculptor and countryman of his, as professor in the Royal School of Fine Arts, which had then just been established at Bāngkōk. These two artists remained there for three years, at the end of which period the painter Turchi met with an untimely death (July, 1895) whilst ill in Singapore on his way back to his own country.

GROUP XXIII

The Art of Printing

Serial No.	Exhibitor.	Description of Exhibits.
	Class 144. Paper	
926	Royal Agricultural College	Sample of Siamese bark paper (one sheet).
927	,, ,,	Siamese blank book of folded black bark paper.
928	,, ,,	Siamese blank book of folded white bark paper.
	Class 157. Original Sketches for Picture Postcards exhibited by their Author	
	Landscapes in Siam and sketches of Siamese life and customs	
929	Professor C. Ferro, Painter, Turin	A creek in Bāngkōk.
930–1	.. ..	Views of Wat P'hô.
932–3	.. ..	Views of my house garden.
934	.. ..	Creek at low tide (morning time).
935	.. ..	Wat P'hraḥ Kĕu (royal temple).
936	.. ..	Plain of Siam.
937	,, ,,	The River Mĕ-Nam (Bāngkōk River).
938	.. ..	Temple entrance (sketch).
939	.. ..	Siamese girl (study in oil-colour).
940	.. ..	Wat Sraḥ Prathum.
941	.. ..	Wat P'hraḥ Kĕu (royal temple).
942	.. ..	Siamese lad.
943	.. ..	P'hraḥ Prāng Sī Lúang.
944	.. ..	Deserted temples.

Serial No.	Exhibitor.	Description of Exhibits.
945	Professor C. Ferro, Painter, Turin	Chinese lad (red crayon).
946	.. ..	Siamese girl.
947	.. ..	China woman.
948	.. ..	P'hraḥ Prāng Sī Lúang.
949	.. ..	Wat Sraḥ Prathum.
950	.. ..	Chinese boats (monotype).
951	.. ..	Temple yard (monotype).
952	.. ..	Two Buddhist monks (sketch).
953	.. ..	View of my house garden.
954	.. ..	Wat P'hraḥ Kĕu (Royal temple).
955	.. ..	Wat Rājabop'hitr.
956	.. ..	The River Mĕ-Nam (Bāngkōk River).
957	.. .	Little Siamese boy (drawing in colour).
958	.. ..	Buddhist monks (drawing in colours).
959	.. ..	Wat Sraḥ Prathum.
960	.. ..	Chinese singers and musicians (*fusain*).
961	.. ..	Siamese girl (pastel).
962	.. ..	Wat Rājabop'hitr (inner temple yard).
963	. ..	Buddhist monks by the entrance to Wat P'hraḥ Kĕu.
964	.. ..	.. .. ..
965	.. ..	Siamese girl.
966	. ..	Buddhist monk (drawing).
967	.. ..	Little Siamese girl.
968	.. ..	Buddhist monks returning from the temple.
969	.. ..	Siamese girl (red crayon).
970	. ..	Buddhist monk.
971	.. .	Wat Rājabop'hitr.

Serial No.	Exhibitor.	Description of Exhibits.
972	Professor C. Ferro, Painter, Turin	Siamo-Chinese girl.
973	.. ..	Wat Suthat (entrance).
974	.. ..	Creek in Bāngkōk.
975	.. ..	Siamese girl.
976	.. ..	Siamese dancing-girl (*lakhōn*).
977	.. ..	Mōñ (Peguan) girl.
978	.. ..	Interior of Wat Suthat.
979–81	.. ..	Peristyle of Wat P'hraḥ Kĕu—front, back, and entrance.
982	.. ..	H.M. the late King Chuḷālongkorṇ (sketch in colours).
983	.. ..	Siamese nobleman.
984	.. ..	Interior of Wat Suthat.
985	.. ..	Principal entrance to Wat P'hraḥ Kĕu.
986	.. ..	Principal entrance to Wat Rājabop'hitr.
987	.. ..	Typical Siamese man.
988	.. ..	Chinese theatrical.
989	.. ..	A creek in Bāngkōk (evening, after a rain-shower).
990	.. ..	Typical Siamese man.
991	.. ..	Interior of Wat P'hô.
992	.. ..	Entrance to Wat Rājabop'hitr (pastel).
993	.. ..	Little Siamese girl in her costume.
994	.. ..	Buddhist monk.
995	.. ..	Wat P'hô, inner yard of the temple.
996	.. ..	A creek (drawing).
997	.. ..	Interior of temple, Wat Suthat.
998	.. ..	Interior of Royal temple (Wat P'hraḥ Kĕu).
999	.. ..	Wat Rājabop'hitr.
1000	.. ..	Siamese dancing-girl (*lakhōn*).

Serial No.	Exhibitor.	Description of Exhibits.
1001	Professor C. Ferro, Painter, Turin	Wat Rājabop'hitr.
1002	.. ..	Procession of Royal barges on the Mĕ-Nam River.
1003	.. ..	Siamo-Chinese girl (pastel).
1004	.. ..	The Royal City (Palace).
1005	.. ..	Bridge and Chinese sailing-boats.
1006	.. ..	A creek (drawing in colours).
1007	.. ..	Doors of the Royal temple (Wat P'hraḥ Kĕu).
1008	.. ..	Ancient door with Chinese deities (Wat P'hô).
1009	.. ..	Wat Rājabop'hitr, interior of the little yard.
1010	.. ..	Wat P'hô, exterior.
1011	.. ..	A creek.
1012	.. ..	Wat P'hô (drawing).
1013	.. ..	Chinese customs; gamblers, etc.
1014	.. ..	Paddler of the Royal barges.
1015	.. ..	Siamese Buddhist monk.
1016	.. ..	Deserted temple.
1017	.. ..	Rice-boats on the Mĕ-Nam River.
1018	.. ..	Little yard in Wat P'hô.
1019	.. ..	The Mĕ-Nam River.
1020	.. ..	A creek.
1021	.. ..	Square before the entrance of a temple.
1022	.. ..	Inner yard of a temple.
1023	.. ..	A creek in Bāngkōk.
1024	.. ..	Wat Sraḥ Prathum.

APPENDIX

Noteworthy Events and Results

of the

Siam Exhibition at Turin

Exhibits relative to silk-spinning and weaving (see p. 221).

I. Short Chronicle of the Exhibition

AS already mentioned on p. xlix of the Introduction (q.v.), the Siamese Pavilion, with the assemblage of exhibits displayed therein, was opened with fitting ceremony in the forenoon of May 27, 1911, in the presence of a large and distinguished gathering of representatives and guests. These included Senator J. Vittorelli, Prefect of the Turin Province; Senator S. Frola, President of the General Committee of the Turin Exhibition; Comm. A. Bianchi, Vice-President of the Executive Committee of the same; most of the Commissioner-Generals, or their Deputies, of the other nations represented at the Exhibition; delegates of the Turin Municipality, Chamber of Commerce, and of the principal Government and Town institutions; the leading artists and business men; and, last, but not least, the representatives of the Press, both local and foreign. Altogether the company numbered upwards of three hundred, the fair sex being also conspicuous notwithstanding the morning hour. The small staff of the Siamese Section was, of course, *au complet* to welcome the guests at the principal entrance to the Pavilion. The guests were introduced into the Central Hall, where, shortly after 10 o'clock, the auspicious ceremony commenced in front of the lofty niche of honour, adorned with the life-size portraits of the King of Siam and his august parents, and draped with Siamese royal flags (see p. lxviii above).

The proceedings opened with a speech by Colonel Gerini, the Commissioner-General, who conveyed the most cordial greetings of the Siamese nation to Italy and to Turin in particular, expressing the best wishes for the success of the splendid

World's Fair Turin had so admirably organized to celebrate the fiftieth anniversary of the accomplishment of the Italian National Unity. After dwelling at some length on the highly amicable relations that had, from the remote past, ever existed between Italy and Siam, as a result and confirmation of which Siam had earnestly responded to the invitation of Turin to participate in the feast of labour and industry the earliest capital of United Italy was just about holding, the speaker wound up his address by most heartily thanking the company for their kindness in honouring the opening ceremony of the Siam Pavilion with their presence, and expressed the wish that the Show might lead to a further increase of commercial intercourse between Italy and Siam for their mutual benefit.

Senator Frola, the President of the General Committee of the Turin Exhibition, thereupon responded in sympathetic terms, saying among other things that by the present Exhibition, which surpassed for completeness, importance, and tasteful arrangement anything that might have reasonably been expected from a land lying so far away, in the very centre of the awakening Far East, Siam had fully revealed herself to the world as one of its most progressive nations, socially as well as industrially. While the characteristic architectural beauty of the Pavilion excited admiration, no less praise was due to the perfect organization of the Show, which had been so speedily got into readiness and which was so thoroughly representative of the arts, industries, and products of the country. He ended by thanking, in the name of Italy and Turin in particular, rising Siam for having so splendidly and heartily participated in the Turin Exhibition, and by wishing her Sovereign, people, and country every possible prosperity and success.

Comm. Bianchi followed on behalf of the Executive Committee of the Turin Exhibition, and he expressed himself in no less appreciative terms, as may be seen from the following passages: "The far outlying Siam, kindly joining with us in the celebration of our national jubilee, successfully put in evidence the high standard of civilization she has reached, which is such as to place her abreast of the most progressive

countries of our Old Europe. . . . We have full cause to rejoice that the most beautiful and interesting products of Siam are enshrined in such a fine casket, really worthy of them, in a building as highly elegant as original, and which reproduces all the characteristic charm of the Siamese national architecture. . . . We cannot more aptly express our feelings of gratitude and admiration than by reverently shouting: 'Long live His Majesty the King of Siam!'"

After this the Commissioner-General led the company round on a visit to the exhibits displayed in and about the Pavilion, and ultimately an adjournment was made to the Siamese Café in the basement underneath to partake of refreshments. The health of Italy and Siam, of their Sovereigns and peoples, was enthusiastically honoured, followed by many a cordial toast to Turin, to the other nations represented at the Exhibition, and to the Committee of Organization of the same. The refreshments included Chanthabūrn coffee, which all pronounced excellent and in every way worthier of a wider diffusion. It was just about noon when the select gathering dissolved and the Pavilion was thrown open to the public, who had meanwhile been flocking in large crowds about its precincts eagerly awaiting to gain admittance.

As soon as the longed-for moment arrived a gay rush set in, and before the day closed over fifty thousand people had made their acquaintance with the Siam exhibits. Nor did such lively interest abate till the very close of the Exhibition; on festive days, especially, the halls were so crowded that progression became a puzzling problem. It is no exaggeration to say that every visitor to the Exhibition made a particular point of seeing the Siam Pavilion and of finding out for himself all about the mysteries of the fascinating structure. As the Turin Exhibition boasted of fully seven and a half million visitors, and it may safely be asserted that all of them would be anxious to see the Siam Pavilion, it follows that the building had the privilege of welcoming seven and a half million guests, exactly the population of Siam, thus fully justifying both its purpose and symbolic character.

Many were the personages that honoured it with a visit,

whether Italian, Siamese, or others, including even Royalty; suffice to mention among others H.M. the King of Italy (October 5, 1911), H.R.H. the Duke of Bisṇulôk, Heir Apparent to the Siamese Throne (September 25–6), and H.R.H. the Prince of Songkhlā (May 23–4). Most of the Siamese diplomatists and students in Europe have, moreover, availed themselves of the opportunity of beholding, proudly towering on the bank of the River Po, this faithful reproduction of the architectural monuments of their beloved fatherland, and of finding in it, gathered together, the most eloquent evidence of her many natural resources, valuable productions, and rapid industrial and social progress, figuring with honour by the side of those displayed by over a score of other nations. A feeling of legitimate satisfaction at the well-deserved success achieved by their mother country in this world competition must have then possessed them, but accompanied at the same time by the determination to persevere in emulating the other nations in the highest industrial and social developments which they had placed on evidence in their respective sections at the Turin Exhibition.

Among the many pleasant facts worthy of being put on record in connexion with the Siam Section is that of its having had throughout a *bonne presse*, from which it derived much welcome encouragement. Glowing accounts of it have, in fact, appeared in wellnigh all Italian and in many of the foreign papers, a list of which, though unfortunately very incomplete, is given below (see pp. 295–300).

The demand for articles of Siamese produce and manufacture has been all the time very brisk; albeit, owing to the mainly representative character of the Show, only a very limited quantity of such were for sale. Mats, wickerwork, and straw articles, cutlery, and even pottery were much sought after, while on the other hand the mining, agricultural, and forestal produce (especially woods, drugs, dye stuffs) attracted continuous attention on the part of business men, from whom many inquiries were received. The Chanthabūrn coffee and pepper available were disposed of in small parcels to the very last grain; many applications were made in vain not only for such articles but also for several others, e.g. benjoin, sticklac, dye

substances, minerals, etc., of which mere samples were on view. No less keen an interest was aroused by the products of industrial arts like silver repoussé wares, knick-knackery, feather fans, and dramatic masks, which two last were early disposed of, yet leaving many demands unsatisfied.

The close of the Exhibition having been fixed to take place on November 20 owing to the advanced season, the day before that some 150,000 people thronged in to have a last look and bid adieu to what had proved, in every outward respect, a most successful World's Fair. In such a parting visit the Siamese Section was not forgotten, and deep regrets were expressed on all sides that such a refulgent vision of Far Eastern imagery of glittering roofs and golden spires should be doomed to disappear as mysteriously as it had come for the delight of the millions. But such is the fate of transient things, and of Exhibitions perhaps even more than of any other human undertaking; nevertheless, if it has now dissolved like a fairy dream—and one must bow to the inevitable—the gloom brought about by its disappearance is to some extent dispelled by the thought that its memory will long linger, associated with a host of pleasant recollections, in the mind of all visitors to the Turin Exhibition.

II. List of Jurors appointed on behalf of Siam, and brief account of International Jury Operations

In accordance with the regulations for the institution of an International Jury to adjudge the exhibits at the Turin Exhibition, the following places on the High, Group, and Class Juries were allotted to Siam, to fill which the gentlemen named below were appointed under approval of the Royal Siamese Government :—

HIGH JUROR

Comm. V. Mantegazza.

Group Jurors

(appointed from those who had been elected to fill places on the Class Jury Boards)

1.	Nob. C. Rolandi-Ricci	Vice-President for Class	59
2.	Prof. C. Ferro	,, ,,	157
3.	Dr. V. Gerini	,, ,,	95
4.	Chev. A. Cominetti	Secretary-referee for Classes	15-16
5.	Prof. E. Ferrari-Pietrogiorgi	Class	54
6.	Nob. A. Rolandi-Ricci	Classes	92-4
7.	Dr. L. D. Visetti	Class	127

Class Jurors

1.	Chev. G. Vigna dal Ferro	for Class	3
2.	Chev. A. Cominetti	Classes	15-16
3.	G. Molfese, C.E.	Class	18
4.	A. B. Spigno, C.E.	Classes	35-7
5.	Chev. L. Marzocchi, C.E.	,,	39 40
6.	Chev. M. Passalacqua (Managing Director of the 'Italia' Navigation Co.)	,,	41 2
7.	Prof. E. Ferrari-Pietrogiorgi, C.E.	Class	54
8.	Nob. C. Rolandi-Ricci	,,	59
9.	Prof. Arch. A. Rigotti	Classes	72-4
10.	Chev. G. Ceragioli, Painter	,,	77-8
11.	Count G. Cepollini of Alto and Caprauna, LL.D.	,,	79 80
12.	Nob. A. Rolandi-Ricci	,,	92 4
13.	Dr. V. Gerini	Class	95
14.	Geom. C. Ray	,,	110
15.	F. Osimo, Phar. Chem.	,,	118
16.	Dr. G. Calvi	,,	122
17.	Dr. L. Visetti	,,	127
18.	Prof. T. Allievo (Turin Polytechnic Inst.)	,,	130
19.	E. Saibene, Esq. (Managing Director of the Italian Silk Storing Co.)	,,	131
20.	G. Giani, Sculptor	Classes	133 4
21.	E. Bianchi, Esq.	Class	137
22.	Dr. G. Osimo	Classes	138 9
23.	Prof. C. Ferro (Albertine Academy of Fine Arts)	Class	157

The International Class Jury of the Turin Exhibition commenced operations on September 5, 1911, terminating its task on September 20. Its findings were submitted to the Group Jury, which assembled on September 22 and reported its decisions on the 28th of the same month.

On October 1 the International High Jury began to meet for final decisions, and completed work on October 8. Thereupon a formal proclamation of the awards accorded to the exhibitors of the various nations took place on October 19, 1911, in the magnificent Salon des Fêtes within the Exhibition grounds, when every Commissioner was handed a list of the prizes won by the exhibitors who participated in the World's Fair.

So far as the exhibitors from Siam are concerned, a list of their prizes will be found below. In order, however, to form a correct idea of the method followed by the International Jury in adjudging the awards, it should be noticed that while the lots of exhibits in the Siam Section submitted to the Jury for examination were 103 in number, these were ultimately reduced to ninety-six only, it being found advisable to combine some of them in a single lot. This was effected in the case of the lots bearing the following serial numbers, where it was a question of exhibits closely related together and belonging to one and the same owner, viz.:—

Group XVI, Class 90. Nos. 469, 474, 476, and 482–96 were combined in one lot.

Group XVI, Class 90. Nos. 470, 477 9, and 497–9 were combined in one lot.

Group XIX, Classes 130–1. Nos. 685 90 and 692–5 were combined in one lot.

Group XXI, Class 137. Nos. 829 and 913–14 were combined in one lot.

Thus making four lots altogether out of eleven, with an aggregate reduction of seven in the lots to be adjudged.

At the same time, in connexion with the Exhibition there was held also, among many other events, an International Photographic Competition, in which four exhibitors from Siam took part, winning the prizes respectively specified also in the lists below.

III. Prizes won by Exhibitors in the Siamese Section

The award of the International Jury of the Turin Exhibition was, so far as the exhibits from Siam were concerned, substantially as follows:—

5 Grands Prix.
10 Diplômes d'Honneur.
21 Gold Medals.
25 Silver Medals.
18 Bronze Medals.
10 Mentions Honorables.

Total 89 Prizes.

Furthermore, there were awarded, in connexion with the International Photographic Competition, the following prizes to exhibitors from Siam:—

1 Diplôme d'Honneur.
1 Gold Medal.
2 Bronze Medals.

Grand total 4 + 89 = 93 Prizes.

The names of the respective winners of such prizes will be found in the detailed list that follows below (pp. 288–93).

Considering that the number of exhibitors from Siam who participated in the Turin Exhibition was fifty only, of whom three (viz. Professor Arch. A. Rigotti, Professor C. Ferro, and Colonel G. E. Gerini) were *hors concours* because members of either the Siamese Committee or the International Jury, it follows that only forty-seven of them actually remained in competition; these succeeded, however, in securing as many as eighty-nine prizes; or ninety-three if those won in the International Photographic Competition are also to be included.

On the other hand, if we compute the number of prizes won in relation to the number of exhibits in the Siam Pavilion, we find (leaving out four lots of exhibits declared to be *hors concours*, viz. Nos. 249, 299, 317*a*, and 929–1024) that out of 103 lots of exhibits submitted to the International Jury for examination,

and reduced to ninety-six through amalgamation as explained above (p. 281), eighty-nine and ninety-three lots respectively were awarded prizes. This yields, respectively, 92·71 and 96·87 per cent of prizes won on the exhibits that actually took part in the competition for awards. As a matter of fact, all lots of exhibits, except seven, secured prizes of some sort; not counting, of course, the four *hors concours* and the seven which were merged into other lots (p. 281).

All these data have been embodied for easier reference in the subjoined table, while in another one which follows have been entered, in order of merit, the names of the successful winners of the various prizes.

There is no gainsaying the fact that the result is highly encouraging, the more especially as it outdistances anything yet achieved by Siam at World's Fairs in which she has participated prior to the present one. It will be noticed that not only her mining, agricultural, and forestal produce, but also her arts and manufactures, and, what is of no less import, her recent developments in connexion with education, public works, and Civil Services in general, have been highly and gladly appreciated as affording incontrovertible evidence of the rapid progress the country has made even during the last few years. Well was it, then, that she availed herself of this opportunity to reveal herself to the world in an aspect which before was a sealed book to the many. May this splendid and well-deserved success encourage her to continue to strive towards those high ideals that form the aim of the present go-ahead age.

Synoptical Table of Prizes won by Siam at

N.B. Figures preceded by the sign + represent additional prizes

GROUPS AND CLASSES IN WHICH SIAM EXHIBITED.

GROUP.	CLASS.
I. Education	3. Commercial Teaching . .
III. Photography and its applications	16. Artistic Photography . .
	17. Colour Photography . . .
	18. Map reproductions by photographic processes
VI. Public Works	35. Building Materials . . .
	37. Plans, etc., of Buildings .
VII. Means of Transport . .	38. Conveyances for ordinary roads
	40. Railways . . . . .
VIII. Navigation	41. Vessels . . . . .
	46. Inland Navigation . . .
X. Postal Service	54. Postal Organization, etc. .
XI. Sporting Industries . . .	59. The Turf, Racing, etc. . .
XIII. Decoration, Furniture, etc.	72. Cabinet-work, etc. . . .
XIV. Theatre, etc.	77. Theatre Material . . . .
XV. Sylviculture and Forest Industries	80. Wood Management . . .
	82. Fishing . . . . .
	Carried forward . . .

the Turin International Exhibition, 1911

won in the International Photographic Competition.

No. of Exhibitors			No. of Lots of Exhibits		No. of Lots of Exhibits taken in examination		Analysis of Prize Awards.						
In competition.	*Hors concours.*	Total Number.	Submitted to Jury.	Admitted by Jury.	That were awarded prizes.	That gained no prize.	Grand Prix.	Diplômes d'Honneur.	Gold Medals.	Silver Medals.	Bronze Medals.	Mentions Honorables.
1		1	1	1	1			1				
								+1				
2		2	2	2	2				2			
									+1		+1	
1		1	1	1	1					1		
											+1	
1		1	1	1	1			1				
	1	1										
	No. 249.											
1	1	2	1	1	1		1					
	No. 299.											
1		1	1	1	1				1			
1		1	1	1	1		1					
2		2	2	2	2							2
1		1	1	1	1			1				
1	1	2	1	1	1		1					
	No.317*a*											
1		1	1	1	1			1				
1		1	1	1	1			1				
1		1	1	1	1		1					
8		8	8	8	8			1	2	3	2	
1		1	1	1	1				1			
24	3	27	24	24	24		4	6	6	4	2	2
								+1	+1		+2	

GROUPS AND CLASSES IN WHICH SIAM EXHIBITED.

GROUP.	CLASS.	
	Brought forward . . .	
XVI. Agriculture	92. Gardening Implements, etc.	
	95. Sericulture	
	87. Husbandry Machines . .	
	90. Produce from extensive cultivation	
XVII. Food Industries and Products	98. Farinaceous Articles, etc. .	
	100. Confectionery	
XVIII. Extractive and Chemical Industries	106. Mining Products, etc. . .	
	110. Ceramic Industries . . .	
	115. Distillation of Wood . .	
	118. Industry of Fats, Soaps, etc.	
	119. Dye Stuffs	
	122. Skins and Leather, Tanning, etc.	
	123. Perfumery, Oils, etc. . .	
	124. Tobacco	
XIX. Textile Industries . . .	127. Cotton, etc.	
	129. Textile Fibres	
	130. Silk Weaving	
	131. Silk Yarns and Fabrics . .	
XX. Wearing Apparel Industry	133. Dress, Embroidery, Fans, etc.	
XXI. Precious Stones and Metals, Knick-knackery, etc.	135. Jewellery, Gold and Silver Ware	
	137. Wickerwork, etc.	
XXII. Leather and similar industries	138. Tanning	
XXIII. The Art of Printing . .	141. Paper	
	157. Original Sketches for Picture Postcards	
	Total	
	Additional Prizes won in the International Photographic Competition .	

No. of Exhibitors			No. of Lots of Exhibits		No. of Lots of Exhibits taken in examination		Analysis of Prize Awards.					
In competition.	*Hors concours.*	Total Number.	Submitted to Jury.	Admitted by Jury.	That were awarded prizes.	That gained no prize.	Grand Prix.	Diplômes d'Honneur.	Gold Medals.	Silver Medals.	Bronze Medals.	Mentions honorables.
24	3	27	24	24	24		4	6 + 1	6 + 1	4	2 + 2	2
2		2	2	2	2				2			
2		2	2	2	1	1		1				
1		1	1	1	1							1
21		21	21	15	15					5	10	
2		2	2	2	2				2			
6		6	6	6	6				1	4	1	
1		1	1	1	1		1					
2		2	2	2	1	1						1
1		1	1	1	1						1	
2		2	2	2	2					2		
1		1	1	1	1							1
4		4	4	4	4					1	3	
2		2	2	2	2					2		
4		4	4	4	4					2		2
2		2	2	2	2				1	1		
2		2	2	2	1	1			1			
2		2	2	1	1					1		
6		6	6	6	6			2	3	1		
1		1	1	1	1				1			
3		3	3	3	3			1	1	1		
9		9	9	9	5	4			2	1	1	1
2		2	2	2	2				1			1
1		1	1	1	1							1
	1 Nos. 929 to 1024.	1										
103	4	107	103	96	89 + 4	7	5	10 + 1	21 + 1	25	18 + 2	10

List of Prizes awarded to Exhibitors in the Siam Pavilion

5 GRAND PRIX

			Group	Class
1.	Royal Public Works Department	Photos of public buildings, bridges, etc.	VI	37
2.	Royal Railway Department	Photos of railway lines, stations, and bridges	VII	40
3.	Royal Post and Telegraph Department	Photos of office buildings and work accomplished	X	54
4.	Royal Commission for Foreign Exhibitions	Dramatic masks	XIV	77
5.	Royal Agricultural College	Mining exhibits	XVIII	106

10 DIPLÔMES D'HONNEUR

1.	Royal Education Department	School exhibits	I	3
2.	Royal Survey Department	Maps	III	18
3.	Royal Irrigation Department	Photos of navigation locks, etc.	VIII	46
4.	The Royal Court	Photos of Siamese ponies	XI	59
5.	Ministry of Interior	Reproductions of gold prints	XIII	72
6.	Royal Forest Department	Exhibits of woods	XV	80
7.	Royal Agricultural College	Silkworm samples, implements, mulberry leaves, cocoons	XVI	95
8.	Royal Agricultural College	Samples of spun and twisted silk	XIX	130 131
9.	Province of Chanthabūrn	Silk fabrics	XIX	131
10.	Royal Commission for Foreign Exhibitions	Silver ware	XXI	135

21 GOLD MEDALS

			Group	Class
1.	Robert Lenz & Co.	Artistic photos	III	16
2.	K. Döhring	„	III	16
3.	Province of Nagara Rājasīmā	Models of bullock-carts	VII	38
4.	Royal Agricultural College	Samples of forest produce	XV	80
5.	East Asiatic Co., Ltd.	„ „ „	XV	80
6.	Royal Agricultural College	Models of fishing implements	XV	82
7.	Province of Nagara Rājasīmā	Jungle and agricultural knives	XVI	92
8.	Province of Ayuddhyā	„ „ „	XVI	92
9.	Royal Customs Department	White rice	XVII	98
10.	L. Xavier	White and granulated rice	XVII	98
11.	H. Swee Ho	Essences and extracts	XVII	100
12.	Royal Agricultural College	Grass and tree cotton	XIX	127
13.	Royal Agricultural College	Textile fibres	XIX	129
14.	Province of Nagara Rājasīnā	Silk fabrics	XIX	131
15.	Province of Patāni	„	XIX	131
16.	Province of C'hump'hōn	„	XIX	131
17.	Province of Ayuddhyā	Feather fans	XX	133
18.	Prison Department	Iron and bronze wares	XXI	135
19.	Province of Singora	Mats	XXI	137
20.	Province of Chanthabūrn	„	XXI	137
21.	Royal Customs Department	Horns, skins, hides, and mangrove bark	XXII	138

25 SILVER MEDALS

			Group	Class
1. A. H. Duke	Colour photography (autochromes)		III	17
2. Royal Customs Department	Samples of wood and forest produce		XV	80
3. Sriracha Co., Ltd.	,,	,,	XV	80
4. Province of P'hūket	,,	,,	XV	80
5. Province of Ayuddhyā	,,	seeds	XVI	90
6. Province of Bāngkōk	,,	paddy, millet, etc.	XVI	90
7. Royal Customs Department	,,	paddy, etc.	XVI	90
8. Province of Nagara Rājasīmā	,,	white tilseed	XVI	90
9. Province of Nakhōn Chaiśrī	,,	paddy	XVI	90
10. Province of P'hūket	,,	nutmegs	XVII	100
11. Oriental Store	,,	coffee	XVII	100
12. East Asiatic Co., Ltd.	,,	Chanthabūrn pepper	XVII	100
13. Royal Agricultural College	,,	Chanthaburn pepper	XVII	100
14. Royal Agricultural College	,,	potash for soap	XVIII	118
15. Siam Industries Syndicate	,,	soap	XVIII	118
16. Royal Agricultural College	,,	lacquer and rubber	XVIII	122
17. A. Berli & Co.	,,	benjoin	XVIII	123
18. Royal Agricultural College	,,	oils for perfumery	XVIII	123
19. Siam Tobacco Co., Ltd.	,,	Siamese tobacco and cigarettes	XVIII	124
20. G. Pappayanopulos	,,	cigarettes and photos	XVIII	124

		Group	Class
21. Province of Chanthabūrṇ	Samples of cotton fabrics	XIX	127
22. Province of Nagara Rājasīmā	Loom and spinning apparatus	XIX	130
23. Province of Nagara Śrī Dharmarāj	Silk scarfs	XIX	131
24. M. Tamagno	Old Siamese silver ware	XXI	135
25. Province of Ayuddhyā	Straw hats, etc.	XXI	137

18 BRONZE MEDALS

1. Lim Geok Beng	Samples of sticklac	XV	80
2. K. Chia E	,, mangrove bark	XV	80
3. Province of Chanthabūrṇ	,, *p'hung-thalāi* seeds	XVI	90
4. Province of Bisṇulôk	,, maize	XVI	90
5. Province of Nakhōn Sawan	,, cotton seeds	XVI	90
6. Province of P'hejburī (P'hetchaburī)	,, paddy	XVI	90
7. Province of Prāchīn	,, ,,	XVI	90
8. Province of P'hetchabūrṇ	,, tobacco seeds	XVI	90
9. Province of Ayuddhyā	,, *pō* and *til* seeds	XVI	90
10. Province of Samudr Songkhrām	,, tobacco seeds	XVI	90
11. Koh Krāng District	,, ,, ,,	XVI	90
12. Royal Agricultural College	,, cocoanut	XVI	90
13. Royal Agricultural College	,, coffee and cardamom	XVII	100
14. Royal Agricultural College	,, wood oil	XVIII	115

		Group	Class
15. L. C. Teck	Leather tanned with mangrove bark	XVIII	122
16. East Asiatic Co., Ltd.	Samples of gutta-percha	XVIII	122
17. A. Berli & Co.	„ „	XVIII	122
18. Royal Prison Department	Wicker-work, etc.	XXI	137

10 MENTIONS HONORABLES

1. Province of Nakhōn Sawan	Models of boats	VIII	41
2. Province of Śrī Dharmarāj	„ „	VIII	41
3. Province of Ayuddhyā	„ ploughs	XVI	87
4. Royal Agricultural College	Samples of earthenware	XVIII	110
5. L. C. Teck	Leaves, berries, and extract of *maklüa*	XVIII	119
6. Royal Commission for Foreign Exhibitions	Samples of Siamese tobacco	XVIII	124
7. Royal Agricultural College	„ „ „ and cigars	XVIII	124
8. Province of Nakhōn C'haiśrī	Cigarette cases	XXI	137
9. L. C. Teck	Mangrove bark	XXII	138
10. Royal Agricultural College	Siamese paper	XXIII	144

Prize Awards to Exhibitors from Siam who took part in the International Photographic Competition

DIPLÔME D'HONNEUR

K. Döhring, for reproductions of gold and silver prints.

GOLD MEDAL

Robert Lenz & Co., for artistic photography (life-size portraits of the Royal Family).

BRONZE MEDALS

1. Royal Survey Department, for reproductions of maps.
2. A. H. Duke, for colour photography (autochromes).

IV. Honours awarded to the Siamese Section in the Turin Exhibition

Besides the prizes to exhibitors already referred to above, the High Jury of the Turin Exhibition also awarded by unanimous deliberation, taken in its sitting of October 3, 1911, the following honourable distinctions in acknowledgment of the high patronage and invaluable assistance which contributed so much towards the brilliant success of the Siamese Exhibition at Turin:—

DIPLOMA OF SPECIAL HIGHEST MERIT

H.M. Mahā Vajirāvudh, King of Siam.

6 DIPLOMAS OF HIGH MERIT

1. H.R.H. Prince (*Krom P'hraḷ*) Narēśr Varariddhi, Minister of Public Works.
2. H.R.H. Prince (*Krom P'hraḷ*) Damrong Rājānubhāb, Minister for the Interior.
3. H.R.H. Prince (*Krom Lŭang*) Chandaburī, Minister of Finance.

4. H.H. Prince (*Mōm Chàu*) Charūñ, Minister of Justice.

5. H.E. Chàu P'hyā Vijit Wongśā Wuddhikrai, Minister of Public Instruction.

6. H.E. Chàu P'hyā Wongśānuprabaddh, Minister of Agriculture.

13 DIPLOMAS OF MERIT

1. H.H. Prince (*Mōm Chàu*) P'hrom, Director - General Royal Customs Department.

2. The Director-General, Royal Agricultural Department.

3. L. Weiler, Kgl. Baurat, Director-General Royal Railway Department.

4. W. F. Lloyd, Director Royal Forest Department and Conservator of Forests.

5. C. Allegri, Director Technical Office, Royal Public Works Department.

6. Mōm Rājawongś Toh, Ph.D., Director Royal Agricultural College.

7. Lúang Vanabṛikṣ Bichārṇ, Vice-Director Royal Forest Department and Assistant Conservator of Forests.

8. A. H. Duke, Secretary-General to the Royal Commission for Foreign Exhibitions, Bāngkōk.

9. The Chief Inspector of Schools, Education Department.

10. P'hraḥ Surathan Bidakṣ, Director Royal Prison Department and Governor of Prisons.

11. E. G. Gollo, C.E., Chief Engineer Executive Section, Royal Public Works Department.

12. Professor C. Ferro, Painter of the Views and Types of Siam exhibited in Group XXIII, Class 157.

13. Professor A. Rigotti, Superintending Architect, Siam Pavilion.

2 SILVER MEDALS OF COLLABORATION

1. C. Pruss, Partner and Technical Director, Robt. Lenz & Co. (Group III, Class 16).

2. E. Jorgensen, Manager Bāngkōk Branch, East Asiatic Co., Ltd. (Group XV, Class 80).

TOTAL: 22 honourable distinctions.

V. List of Periodicals containing accounts of the S Turin, 1911

N.B. This is but a very incomplete list owing to many articles and illustrations th having unavoidably escaped attention.

d. = daily ; w. = weekly ; f. = fortnightly ; m. = monthly ; ill. = illustrated ;

Name of Periodical.	Place of Publication.	No.	Date of Issue.	
		A. *Italian Periodicals.*		
L'Esposizione di Torino, 1911 (Official Journal), ill. mag.	Turin . . .	17	March 15, 1911 .	pp. 269–7(and Sh(large tri(
	,, . . .	18	,, 31 ,, .	p. 276. V:
Secolo XIX, d. . . .	Genoa . . .	—	April 2 ,, .	Descriptio
Stampa, d.	Turin . . .	—	,, 29 ,, .	Account o
Esposizioni di Roma e di Torino nel 1911, ill. w. mag.	Milan . . .	16	,, ,, .	p. 127. I and Ex Siam P
Italia Centrale, d. . .	Reggio Emilia	—	May 23 ,, .	Descriptio Exhibiti
Gazzetta del Popolo, d. .	Turin . . .	—	,, 24 ,, .	6 lines a Pavilion
Stampa, d.	,, . . .	—	,, 24 ,, .	4
Italia Centrale, d. . . .	Reggio Emilia	—	,, 26 ,, .	4
Gazzetta di Torino, d. .	Turin . . .	—	,, 26 ,, .	4

ADDENDUM

6. DIPLOMAS OF HIGH MERIT

7. Colonel G. E. Gerini, Commissioner-General of Siam to the Turin Exhibition.

Name of Periodical.	Place of Publication.	No.	Date of Issue.	Subject.
Stampa, d.	Turin . . .	—	May 27, 1911 .	2 columns descriptive of Pavilion and Show.
Momento, d.	,, . . .	—	,, 26 ,, .	1½ ,, ,, ,,
Gazzetta del Popolo, d. .	,, . . .	—	,, 26 ,, .	35 lines ,, ,,
Momento, d.	,, . . .	—	,, 27 ,, .	2¼ columns ,, ,,
Sole, d.	Milan . . .	—	,, 28 ,, .	Telegram, 16 lines, describing opening ceremony of Siam Pavilion.
Corriere della Sera, d. .	,, . . .	—	,, 28 ,, .	,, 48 ,, ,,
Unione, d.	,, . . .	—	,, 28 ,, .	,, 10 ,, ,,
Secolo XIX, d. . . .	Genoa . . .	—	,, 28 ,, .	,, 12 ,, ,,
Cittadino, d.	,, . . .	—	,, 28 ,, .	,, 17 ,, ,,
Caffaro, d.	,, . . .	—	,, 28 ,, .	,, 16 ,, ,,
Adriatico, d.	Venice . . .	—	,, 28 ,, .	,, 16 ,, ,,
Provincia di Cremona, d.	Cremona . .	—	,, 28 ,, .	,, 5 ,, ,,
Corriere del Mattino, d. .	Como . . .	—	,, 28 ,, .	,, 16 ,, ,,
Italia Reale, d. . . .	Turin . . .	—	,, 28 ,, .	25 lines ,, ,,
Sentinella Bresciana, d. .	Brescia . . .	—	,, 28 ,, .	Telegram, 6 ,, ,,
La Vita, d.	Rome . . .	—	,, 28 ,, .	,, 17 ,, ,,
Don Marzio, d. . . .	Naples . . .	—	,, 28 ,, .	,, 14 ,, ,,
Momento, d.	Turin . . .	—	,, 28 ,, .	30 lines ,, ,,
Gazzetta del Popolo, d. .	,, . . .	—	,, 28 ,, .	½ column ,, ,,
Stampa, d.	,, . . .	—	,, 28 ,, .	43 lines ,, ,,
Giorno, d.	Naples . . .	—	,, 28 ,, .	Telegram, 15 ,, ,,

Perseveranza, d. . . .	Milan . . .	—	May 28, 1911 .	16 lines, describing opening ceremony of Siam Pavilion.
Arena, d.	Verona . . .	—	„ 28 „ .	$\frac{3}{4}$ column „ „
Osservatore Romano, d. .	Rome . . .	—	„ 29 „ .	Telegram, 14 „ „
Corriere d'Italia, d. . .	„ . . .	—	„ 29 „ .	„ 13 „ „
Ragione, d.	„ . . .	—	„ 29 „ .	„ 15 „ „
Lavoro, d.	Genoa . . .	—	„ 29 „ .	„ 15 „ „
Capitale, d.	Rome . . .	—	„ 30 „ .	18 lines „ „
Voce delle Marche, d. .	Fermo . . .	—	June 2 „ .	3 „ „ „
Risveglio Commerciale, d.	Bari . . .	—	„ 4 „ .	9 „ „ „
Gran Mondo, ill. fort. mag.	Rome . . .	11	„ 4 „ .	p. 17. Cut, front view of Siam Pavilion.
Domenica del Corriere, ill. w. mag.	Milan . . .	—	„ 4 11 „ .	p. 8. Description „ „
Italia Centrale, d. . .	Reggio Emilia	—	„ 15 „ .	Description and view of opening ceremony of Siam Pavilion.
Esposizioni di Roma e di Torino nel 1911, ill. w. mag.	Milan . . .	22	„ „ .	p. 175. 36 lines descriptive of ceremonial opening of Siam Pavilion.
Esposizioni del 1911, ill. m.	„ . . .	14	„ „ .	p. 220. 2 columns descriptive of Siam Pavilion and Exhibition. p. 221. Full-page plate, front view of Siam Pavilion.
Patria del Friuli, d. . .	Udine . . .	—	September 2, 1911	$1\frac{1}{4}$ columns descriptive of Siam Pavilion and Exhibits; special appreciation of Dramatic Masks.

Name of Periodical.	Place of Publication.	No.	Date of Issue.	Subject.
Corriere della Sera. d.	Milan		September 23, 1911	11 lines on Siam Exhibition.
.. .. ..	..		.. 25 ..	Visit of H.R.H. the Duke of Bisṇulôk, Heir-Apparent of Siam, to the Siam Pavilion; 2 columns, with portrait.
[illegible]	..		.. 26 ..	6 lines on visit of ditto.
Unione. d.	..		.. 26 ..	4 .. .. ..
Gazzetta di Torino. d.	Turin		.. 26 ..	9 .. .. ..
Momento. d.	..		.. 26 ..	8 .. .. ..
Stampa. d.	..		.. 26 ..	11 .. .. ..
Gazzetta del Popolo. d.	..		.. 26 ..	8 .. .. ..
Esposizioni di Roma e di Torino nel 1911. ill. w. mag.	Milan	36	.. ..	Half-page side view of Siam Pavilion.
Italia Illustrata. ill. m.	Rome		.. ..	Reference to Siam Pavilion.
Don Marzio. d.	Naples		October 5 ..	Telegram, 9 lines, on visit of H.M. the King of Italy to Siam Pavilion.
Libertà. d.	..		.. 6 ..	.. 9 .. ..
Italie. d.	Rome		.. 6 ..	.. 8 .. ..
Eco del Balzo. d.	Riva (Trento)		.. 7 ..	.. 8 .. ..
Esposizioni di Roma e di Torino nel 1911. ill. w. mag.	Milan	39	.. ..	p. 310. 11 lines on visit of H.R.H. the Duke of Bisṇulôk to Siam Pavilion.

Fotografia Artistica, ill. m.	Turin . . .	Oct. Nov.	1911	pp. 149 53. Description of Siam Pavilion and Exhibition, with 7 illustrations.
Toro, ill. w.	,, . . .	— November	2 ,,	Reference to rice and rice culture in Siam.
Corriere di Romagna, d.	Ravenna . .	— ,,	3 ,,	1½ columns descriptive of Siam Pavilion and Exhibition.
Sole, d.	Milan . . .	— ,,	21 ,,	24 lines on Siam coffee exhibits and in praise of Chanthabūrn coffee.
Giornale del Commercio, d.	Rome . . .	— ,,	26 ,,	26 lines on same subject.
Italia e Brasile, ill. m. .	,, . . .	— ,,	,,	pp. 309-10. 11 lines descriptive of Siam Pavilion and Exhibition.

N.B. Further numerous references occur in many other Italian newspapers and magazines published during the course of the year 1911, e.g. in—

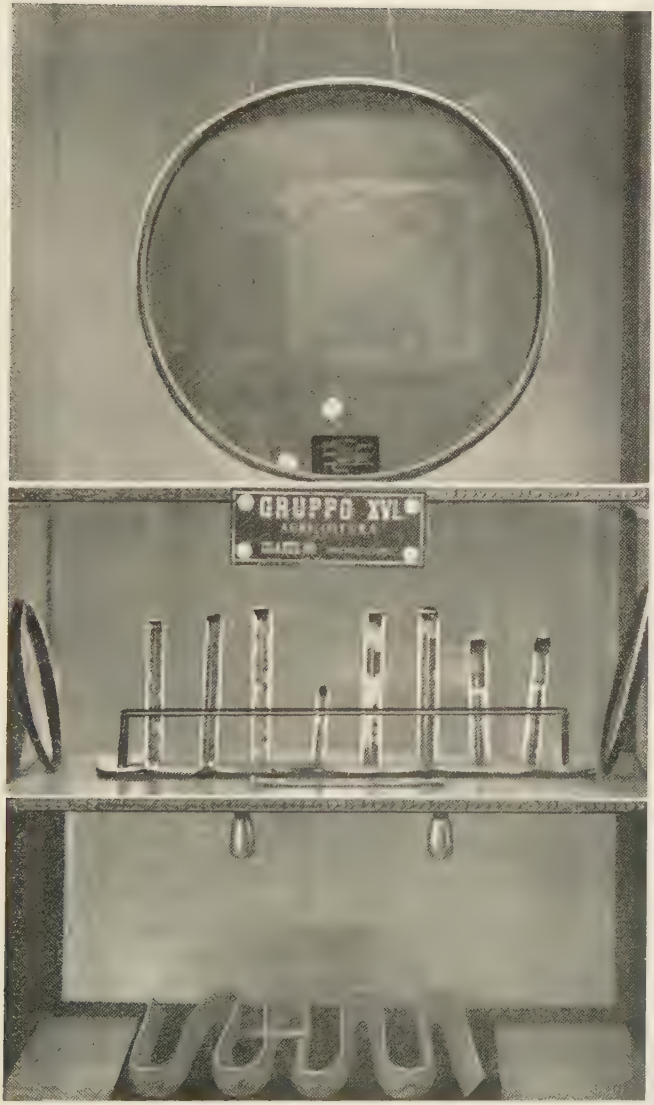
Le Esposizioni di Roma e di Torino nel 1911 (ill. w., Milan), pp. 61, 117, 141, 165.
Giornale dell'Esposizione, 1911 (d., Turin).
Bollettino Ufficiale dell'Esposizione Internazionale di Torino, 1911 (d., Turin).

B. *Foreign Periodicals.*

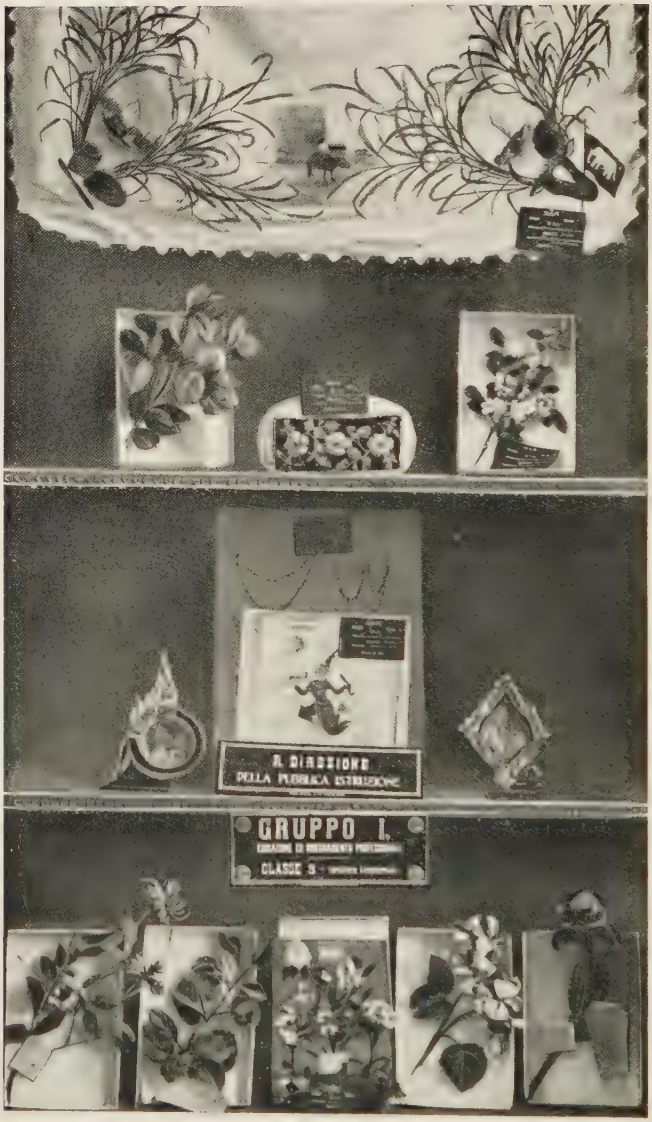
N.B. The subjoined list is even more incomplete than the above, a large number of such publications dealing with the subject having escaped attention.

Progresso Italo-Americano, d.	New York . .	— May	25, 1911 .	Reference to characteristic architecture of Siam Pavilion.
Piccolo, d.	Trieste . . .	— ,,	28 ,, .	Telegram, 5 lines, on opening ceremony of Siam Pavilion.

Name of Periodical.	Place of Publication.	No.	Date of Issue.	Subject.
[illegible]	St. Petersburg	—	June 1, 1911	Reference to Siam Pavilion.
Chronique, d.	Marseilles	—	„ 7 „	14 lines praising early opening and getting in readiness of Siam Pavilion, and its perfect organization, which may be taken as model.
[illegible]	Altona	—	„ 7 „	12 lines appreciative of Siam Pavilion and Exhibition.
[illegible]	Graz	—	„ 10 „	10 „ „ „
[illegible] zeitung, d.	Krefeld	—	„ 10 „	p. 1. 9 „ „ „
[illegible] Zeitung, [illegible]	Vienna	—	„ 17 „	14 „ „ „
Italie Illustrée, ill. fort.	Paris	23	„ 17 „	pp. 459-60. 2½ columns biography of Commissioner-General for Siam at Turin Exhibition.
Revue Internationale, ill. m.	Nice	—	Special Number, Turin Rome.	1½ pages descriptive of Siam Pavilion and Exhibition, with 5 illustrations.
Patria degli Italiani, d.	Buenos Ayres	—	August 21, 1911	3 lines reference to Siam Pavilion.
Alto Adige, d.	Trento	—	September 16 „	Reference to characteristic appearance of Siam Pavilion.
Brooklyn Citizen, d.	New York	—	October 1 „	„ „ „



Part of the Sericulture Exhibits, Class 95. (See p. 158.)



Part of the Educational Exhibits: Embroidery, hand-painting on silk, artificial flowers. (See pp. 26–7.)

INDICES

Part of photos relative to inland navigation works (see pp. 64–5), models of bullock-carts (see p. 54), and Siamese ploughs (see p. 158).

I. Alphabetical Index of Exhibitors in the Siamese Section of the Turin International Exhibition, 1911

Serial No.	Name.	Place of Residence.	Exhibited in		Page of this Catalogue where the Exhibit is entered.
			Group.	Class.	
1	Agricultural College, R.	Bāngkōk . .	XV, XVI, XVII, XVIII, XIX, XXIII.	80, 82, 90, 95, 100, 106, 110, 115, 118, 122, 123, 124, 127, 129, 130, 131, 144	131, 132, 134–5, 158, 159, 171, 205, 206, 207, 221, 222, 269.
2	Ayuddhyā, Province of	Ayuddhyā .	XVI, XX, XXI	87, 90, 92, 133, 137	157, 158, 159, 227, 248.
3	Bāngkōk „	Bāngkōk . .	XVI	90	158, 159.
4	Berli (A.) & Co., merchants . . .	„ . .	XVIII	122, 123 . . .	207.
5	Biṣṇulôk, Province of	Biṣṇulôk . .	XVI	90	159.
6	Chanthabūrṇ „	Chanthabūrṇ	XVI, XIX, XXI,	90, 127, 131, 137	158, 221, 222, 248.
7	Chia E, K., merchant	Bāngkōk . .	XV	80	132.
8	C'hump'hōn, Province of	C'hump'hōn	XIX	131	122.
9	Commission (The Royal) for Foreign Exhibitions.	Bāngkōk . .	XIV, XVIII, XXI	77, 124, 135 . .	112, 208, 247.
10	Court, the Royal	„ . .	XI	59	76.

Serial No.	Name.	Place of Residence.	Exhibited in		Page of this Catalogue where the Exhibit is entered.
			Group.	Class.	
11	Customs Department, R.	Bāngkōk	XV, XVI, XVII, XXII	80, 90, 98, 100, 138	132, 158, 170 1, 253.
12	Döhring (K.), Esq.	„	III	16	32.
13	Duke (A. H.), Esq.	„	III	17	32.
14	East Asiatic Company, Ltd.	„	XV, XVII, XVIII	80, 100, 122	131, 171, 207.
15	Education Department, R.	„	I	3	19–27.
16	Ferro, Professor C.	Turin	XXIII	157	269–72.
17	Forest Department, R.	Bāngkōk	XV	80	132.
18	Gerini, Colonel G. E.	Cisano	X	54	70.
19	Irrigation Department, R.	Bāngkōk	VIII	46	64 5.
20	Koḥ Krāng, District of	Koḥ Krāng	XVI	90	159.
21	Lenz & Co. (Robert), Photographers	Bāngkōk	III	16	32.
22	Lim Geok Beng, merchant	„	XV	80	132.
23	Ministry for the Interior	„	XIII	72	81.
24	Nagara Rājasīmā, Province of	N. R.	VII, XVI, XIX, XXI	38, 90, 92, 95, 130, 131, 137	54, 157, 158, 159, 221, 222, 248.
25	„ Śrī Dharmarāj „	N. S. D.	VI, VIII, XIX	35, 41, 131	39, 64, 122.
26	Nakhōn C'haiśrī „	N. C.-ś.	XVI, XXI	90, 137	159, 248.
27	„ Sawan „	N. S.	VIII, XVI, XXI	41, 90, 137	64, 159, 248, 249.

28	Oriental Store	Bāngkōk . .	XVII	100	171.
29	Pappayanopulos (G.), manufacturer	„ . .	XVIII	124	208.
30	Patāni, Province of	Patāni . .	XIX	131	222.
31	P'hetchabūṇ „	P'hetchabūṇ	XVI	90	159.
32	P'hetchaburī „	P'hetchaburī	XVI	90	159.
33	P'hūket „	P'hūket . .	XV, XVII, XIX	80, 100, 129 . .	133, 171, 221.
34	Post and Telegraph Department, R.	Bāngkōk . .	X	54	70.
35	Prāchīn, Province of	Prāchīn . .	XVI	90	159.
36	Prison Department, R.	Bāngkōk . .	XXI	135, 137 . . .	247, 248–9.
37	Public Works „	„ . .	VI	37	39.
38	Railway „	„ . .	VII	40	54.
39	Rigotti, Arch. A.	Turin . . .	VI	37	39.
40	Samudr Songkhrām, Province of .	S. S. . . .	XVI	90	159.
41	Siam Industries Syndicate . . .	Bāngkōk . .	XVIII	118	206.
42	Siam Tobacco Company, Ltd. . .	„ . .	XVIII	124	207.
43	Singora (*Songkhlā*), Province of .	Singora . .	XXI	137	248.
44	Sriracha Company, Ltd.	Sriracha . .	XV	80	133.
45	Survey Department, R.	Bāngkōk . .	III	18	32.
46	Swee Ho (H.), manufacturer . . .	„ . .	XVII	100	171.
47	Tamagno, Arch. M.	„ . .	XXI	135	247.
48	„ Mrs. M.	Turin . . .	XVIII, XXI . .	110, 137 . . .	206, 249.
49	Teck (L. C.), merchant	Bāngkōk . .	XVIII, XXII .	119, 122, 138 .	206, 207, 253.
50	Xavier (L.), „	„ . .	XVII	98	170.

II. General Index of Subjects

Note. For Exhibitors' names see the preceding Index. In the present one have been entered all the names of Siamese personages, places, and products (whether forming part of the exhibits or not) referred to in the course of the volume, limiting, however, the toponyms only to such places as occur within the present kingdom of Siam. Of foreign names, persons, and places there have been inserted—consonant with the character and purport of the book—only those of the principal Italian diplomats and travellers who have visited Siam, and of a few chief towns in Italy alluded to in the foregoing pages.

Abbreviations: C. = Central; E. = East, Eastern; N. = North, Northern; S. = South, Southern; W. = West, Western; t. = town; distr. = district; prov. = province; rw. st. = railway station; Pen. = Peninsula; is. = island.

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Yellow robes (Buddhist), 189.
Ylang-ylang, perfume, 194, 195.
Yō (*Morinda*), roots for dyeing, 188.
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III. Index of Siamese Plant Names

Note. For the convenience of those interested in the subject the plant names referred to in the course of this volume have been arranged in the subjoined Index in alphabetical order according to their botanic (Latin) designations. In the second and third columns the Siamese and commercial names have been supplied so far as known. Although the Index, being restricted to plants alluded to in the preceding pages, covers but a small portion of the Siamese flora, it is nevertheless hoped that it will prove useful, especially in view of the scanty lists of Siamese plant names so far available, where either but a few botanical identifications are appended, or the Siamese names are, as a rule, very loosely spelt, or, what is still worse, not given at all. Those collected here are almost entirely drawn from a far larger list, put together by the editor in the course of his researches while in Siam. In the case of the Siamese plant names here subjoined, it should be observed that in practice the connotation *Tôn* 'tree', 'plant', is prefixed to each single name, except when replaced by either of the terms *Thāu* = 'creeper', 'climber', or *Wān* 'tuberous', 'tuberous' plant, in which instances such connotations are prefixed within brackets. The words *Thai* [Siamese] and *Thet* [exotic] occurring at the end of some plant names denote, respectively, the indigenous and imported varieties; while the term *Pā* connotes the wild variety. A query indicates that the identification is doubtful. Owing to the paucity of names of animals and minerals mentioned in the course of the present volume, it has seemed unnecessary to further swell its bulk with separate indices of them, for which the reader is accordingly referred to the General Index of Subjects.

Botanical Name.	Siamese Name.	Commercial Name.	Page.
Acacia catechu (?)	*Sī-sīet*	Cutch, see *Nauclea gambier*	190.
Ægle marmelos	*Matūm*	Bel, bale, or vilva, the Bengal quince	190, 195.
Æschynomene aspera	*Sanô*	The shola, or sola, plant .	266, 267.
Aloexylon agallochum	*Kṛṣṇā*	Agilla, or eagle-wood . .	117, 132, 195, 196.
Alpinia galanga	*Khā*	Galangal, or galanga . .	168.
Amaranthus spinosus	[*P'hak*] *Khôm-nām* . .	Thorny amaranth . . .	187.

Amomum galanga major . . .	*Krawān*	Cardamom	165, 169, 170.
A. villosum	*Rèu*	Bastard cardamom . . .	166, 169, 171.
A. xanthioides	*Krawān*	Siam cardamom . . .	165, 169.
Anamirta cocculus	*Hāng-lái*	Angrai	122.
Andropogon citratus, muricatus .	[*Yā*] *Fĕk Hōm*	Lemon grass	195.
A. nardus	. . . . .	Citronella	195.
A. schœnanthus	*Takhrái*	Ginger grass	195.
Aquilaria agallocha	*Kalamp'hak*	Calambac, or gharu, tree .	196.
Arachis hypogæa	[*Thua*] *Yīsóng*	Ground-nut or pea-nut .	145–6, 159.
Areca catechu	*Māk*	Areca (or betel) nut palm	150, 157.
Artocarpus integrifolia . . .	*Khanún*	Jack-tree, krachi wood .	189.
A. Lacoocha	*Kĕ-lĕ*	A dyewood-yielding tree .	190.
Avicennia tomentosa	*Samĕ̄*	A tree yielding firewood and dye bark	129, 184, 190.
Bambusa, var. sp.	*P'hāi*	Bamboo	34, etc.
Barringtonia acutangula . . .	*Dĕng-chĭk*	Tree yielding a tanning bark	252.
Benzoin subdenticulatum (?) . .	*Kamyān Nua*	Benzoin shrub of Siam .	197, 201.
Bignonia suaveolens and *stipulata*	*Khĕ-fŏi*	Trumpet-flower tree . .	119, 133.
Bixa orellana, var. *Indica* . .	*Kham Fŏi*	Arnotto	189.
Blumea balsamifera	*Nā̆t*	Siamese camphor shrub .	195.
Boehmeria nivea	*Pān*	*Ramie*, Rhea, or China grass	148, 214, 221.
„ „ *tenacissima*			
Bombax heptaphyllum	*Ngāu*	The yellow silk-cotton tree	212.
B. Malabaricum	*Ngiu*	The red silk-cotton tree .	212.
Borassus flabelliformis . . .	*Tān*	Palmyra, tāla, or fan palm	187, 225.

Botanical Name.	Siamese Name.	Commercial Name.	Page.
Butea frondosa	*Thōng Kwāu*	The pulas, red kino, or bastard teak-tree	188.
Buxus Sinensis and *sempervirens*	*P'hut*, or *Fut*	Boxwood	118.
Cæsalpinia sappan	*Fāng*	Sapan-wood	118, 188.
Calamus rotang	*Wāi*	Rattan, or Indian cane .	42, 44, 240.
Cannabis sativa	*Kanc'hā*	Female hemp, or *ganja* .	202.
Capsicum annuum, var. sp. . .	*P'hrik Thāt*	Red pepper	168.
Carapa odorata	*Tabūn*	Crapwood-tree	119.
Carthamus tinctorius	*Kham*, or *Kôsùm* . . .	Safflower	188.
Caryophyllus aromaticus . . .	*Kān P'hlū*	Clove-tree	167, 168.
Caryota urens	*Tau-rōng*	Nibong, or bastard sago-palm	241.
Cassia Siamea	*Khī-lek*	The blood-red cassia-tree .	132, 133.
Cattleya	. . . . .	An orchid	123.
Cedrela Toona	*Yom*	Toon, or bastard cedar-tree, Siam cedar-wood	118, 132.
Cinnamomum silvestre . . .	*Samun Lawëng* . . .	Wild cinnamon	168.
C. Zeilanicum	*Ob-c'hōi*	Cinnamon	168.
Citrus decumana	*Sôm Ò*	Pommelo or shaddock .	150.
Cocos nucifera	*Map'hrāu*	Cocoanut palm	145.
Coffea, var. sp.	*Kāfë*	Coffee plant	138, 165, 170.
Coix lachryma Jobi	*Dïai*	Job's tears, coix millet .	143, 159.
Corchorus capsularis and *olitorius*	. . . . .	Jute	208.
Corypha umbraculifera . . .	*Lān*	Talipot palm	225, 262.

Crinum Asiaticum, var. . . .	*Kôt Hua-bũa*	A fragrant bulbous plant .	195.
Curcuma longa	*Khamín*	Turmeric	168, 189, 195.
Cypripedium	. . . . .	An orchid	123.
Dalbergia latifolia	*P'hayung*	Rose-wood tree	117, 131, 132.
D. nigrescens	*Kān-lũang*	Saffron-wood tree . . .	132.
Dialium ovoideum	*Khlêng*	A hardwood tree . . .	57.
Diospyros hirsuta (?) or *melanoxylon* (?)	*P'hlab Kháu*	A valuable timber-yielding tree	133.
D. embryopteris and *glutinosa* .	*P'hlab*, or *Map'hlab* . .	A dye-yielding tree . .	129, 190.
D. mollis	*Maklũa*	A dye-yielding tree, a species of ebony	191.
Dipterocarpus alatus	*Yāng Dêng*	Red oil-tree	120, 133, 206.
D. lævis	*Yāng Khắu*	White oil-tree	
D. turbinatus and *grandiflora* .	*Yāng*	Wood-oil, or damar-, tree	118, 121, 131, 132, 133, 206, 266.
Disa	. . . . .	An orchid	123.
Dolichos niger	*Thũa Dam*	Black beans	144, 159.
Dyera costulata	. . . . .	*Getah jelutong*, or gutta-percha-tree	193, 207.
Echites sp.	*Katang-katiu*	Wild rubber creeper . .	193, 207.
Eriodendron anfractuosum and *orientale*	*Nún*	White silk-cotton tree . .	212.
Erythrina corallodendrum and *Indica*	*Thông-láng*	The coral-tree	166, 184, 195.
Feronia elephantum	*Makhwit*	The elephant-, or wood-apple, tree	263.

Botanical Name.	Siamese Name.	Commercial Name.	Page.
Ficus religiosa	*P'hô*	*Bo*, or *bodhi*, tree; pīpal	226.
Garcinia Hanburyi	*Madan*, or *Rong* . . .	Gamboge-tree	189.
Gardenia floribunda	*P'hut*	An odoriferous and dye plant	189.
Glycyrrhiza glabra	*C'ha-ēm* (*Thēt*)	Liquorice plant	168.
Gmelina arborea	*Sak tûa Mīa*	'Female teak' tree . .	
Gossypium, var. sp.	*Fāi*	Cotton plant	147.
Guizotia Abyssinica (or *oleifera*)	*Ngā Dam*	Niger seed plant . . .	146, 158, 195.
Hopea frondosa	*Takhīen Lüang*	Yellow *takhīen*	
H. odorata	„ *Hin*	Stone „	118, 133.
H. spuria	„ *Thōng*	Golden „	119, 133.
Indigotiferæ, var. sp. . . .	*Khrām*	Indigo plant	190.
Isonandra acuminata	*Mahāt*	A timber-yielding tree .	133.
Ixora pavetta	*Khêm* (*Thai*)	Siamese ixora	194.
Jasminum grandiflorum and *sambac*	*Mali Sōn*	Double jasmine	194.
Kæmpfera galanga (?)	[*Wān*] *C'hamot*	A fragrant tuberous plant	195.
Kananga odorata	*Kadang-ngā* (*Thai*) . .	Siamese *Ylang-ylang* . .	194, 195.
Lagerstrœmia [*flos*] *reginæ* . .	*Tabĕk*, or *Kabĕk* [*Nā*] .	The queen Lagerstrœmia .	34, 118, 131, 133.
L. floribunda and *macrocarpa* .	*Inthanin*	A timber-yielding tree . .	118, 119, 132, 133.
L. tomentosa	*Tabĕk Nám*	The water Lagerstrœmia .	
Maranta dichotoma	*Khlā*	The straight-stemmed Maranta plant, yielding leaf-stalks for matting .	241.

Melaleuca trijuga	*Sakhrō*	A forest tree	44.
Melanorrhœa usitatissima	*Rāk*	Black-varnish tree	77, 131, 207.
Michelia Champaca	*Champā*	A sort of magnolia-tree	194.
Mimusops Elengi	*P'hikūn*	The fragrant *bakūla* tree	194.
Morinda tinctoria	*Yō Pā*	Wild morinda	188.
Morus Indica, alba, etc.	*Mōn*	Siamese mulberry	151, 156.
Murraya paniculata	*Kēt*	An odoriferous shrub	195.
Musa Paradisiaca, var. sp.	*Klûei*	Banana plant	*passim*.
M. sylvestris	*Klûei Pā*	Wild banana plant	221.
Myristica fragrans (or *moschata*)	*Chan* (*Thēt*)	Nutmeg-tree	167, 171.
Nauclea cordifolia and *rotundifolia*	*Khwāu*	Yellow-wood tree	118, 132.
N. gambier	*Sī-sīet*	Cutch-tree (see *Acacia catechu*)	131, 190, 252.
Nelumbium speciosum	*Būa Lúang*	Royal, or sacred, Lotus plant	144.
Nipa fruticans	*Chāk*	The *atap*, or thatch, palm	57, 202.
Nyctanthes arbor-tristis	*Kanthalikā*	The sorrowful Nyctanthes, or mourning tree, yielding a dye and a perfume	190, 195.
Ochrocarpus Siamensis	*Sārap'hī*	An odoriferous plant	195.
Oncidium		An orchid	123.
Oryza glutinosa	*Khâu Nĕeu*	Glutinous rice plant	See General Index, s.v. 'Rice'.
O. sativa	*Khâu*	Rice plant	
Pandanus furcatus		The lowland screw-pine	211, 241, 242.
P. humilis	*Töi Pā*	The wild screw-pine	

Botanical Name.	Siamese Name.	Commercial Name.	Page.
Pandanus Leman	*Töi*	The sail-leaf screw-pine .	211.
P. odoratissimus	*Lamchïck*	Fragrant screw-pine . .	195, 241.
Pandanus [illegible]	*P'hayōm Thōng* . . .	Golden *p'hayōm* . . .	133.
Parinarium	*Sāi-yut*	An odoriferous plant . .	194.
Paritium macrophyllum . . .	*Pō*	Siamese hemp	148, 159, 214, 221.
Pentacme Siamensis	*Rang*	A timber-yielding tree . .	34, 118, 132.
Phaius	. . . . .	An orchid	123.
Phalaris communis	*Khâu Fāng*	Panicum millet	143, 158.
Phaseolus radiatus, etc. . . .	*Thúa Khïeu* and *Thōng*	Beans and peas	144, 158.
Phyllanthus emblica	*Makhām Pōm*	The emblic Myrobalan .	252.
Pimpinella anisum	*Arā*	Anise plant	168.
Piper betel	*Thâu Phlū*	Betel-leaf creeper . . .	149, 150.
P. longum	*Dī Plī*	Long pepper	167.
P. nigrum	*Phrik* (*Thai*)	Black pepper	166, 171.
Plumiera acutifolia	*Lanthom*	A sort of fragrant jasmine	194.
Pongamia glabra (?)	*Samë Sān*	A tree yielding firewood and a tanning bark	129.
Pterocarpus Indicus	*Padû* or *Pradû*	A valuable timber-yielding tree	117, 121, 131, 132.
P. santalinus	*Lakachan*	See *Santalum rubrum*.	
Pterospermum acerifolium . .	*Kanṇikā*	A dye and odoriferous tree	188.
Rhizophora mangle	*Palông*	The black mangrove tree .	132, 191, 251, 253.
Rottlera tinctoria	*Sët*	Scarlet-dye plant . . .	147, 159, 188.
Santalum rubrum	*Lakachan*, or *Chan Dëng*	Red sandalwood-tree . .	117.

Schleichera trijuga	*Takhrō*, or *Khrō*	A timber-yielding tree	188.
Scilla maritima	*P'hlab-p'hlūng*	Squill	240.
Selenipedium		An orchid	123.
Sesamum Indicum, orientale, etc.	*Ngā Khāu*	Sesamum, or tilseed	146, 158, 195.
Shorea obtusa	*Teng*	A timber-yielding tree	118, 132.
S. robusta and *Siamensis*	*Rang*	The *sāl* tree ; see also *Pentacme Siamensis*	34, 118, 132, 188.
Stachys Alpina	*C'ha-ēm* (*Thai*)	Siamese liquorice-tree; for true liquorice see *Glycyrrhiza*	168.
Sterculia scaphigera	*P'hung-thalāi*	Jelly-fruit tree	144-5, 149, 158.
S. fœtida	*Samrông*	Fœtid *Sterculia* tree	195.
Streblus asper	*Khŏi* (*Yăi*)	Bark-paper tree	132, 264-6.
Styrax Benzoin (?)	*Kamyān Nŭa*	Benzoin shrub; see *Benzoin subdenticulatum*	196-201.
Symplocos racemosa and *tinctoria*	*Lôt*	The *lodh* tree	189.
Tamarindus Indica	*Makhām*	Tamarind	150, 169.
Tectona grandis	*Sak*	Teak-wood; for 'female teak' see *Gmelina*	113, 131, 132.
Trophis aspera, see *Streblus*		The bark-paper tree	
Vanda		An orchid	123.
Wrightia antidysenterica	*Môk Mán*		241.
Xylia dolabriformis	*Mai Dĕng*	Red-wood tree	118, 132.
Zalacca edulis	*Rakam*	The edible zalacca	240.
Zea mais	*Khāu P'hôt*	Maize	143, 159.
Zingiber officinalis	*Khíng*	Ginger plant	168.
Z. sp.	*P'hlai*	Medicinal ginger plant	

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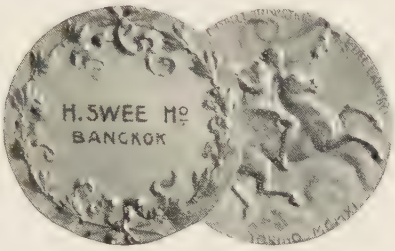
GOLD 

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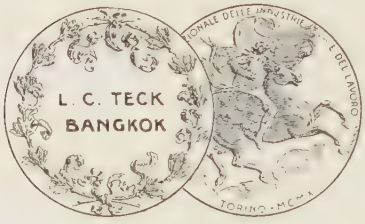

Awarded a
BRONZE MEDAL
for their
Black Dye Extract from MAKLÜA leaves and berries.

Awarded a
MENTION HONORABLE
for their
Mangrove Bark for Tanning.

L. C. TECK,

BANGKOK,

Exporters of Skins & Hides,

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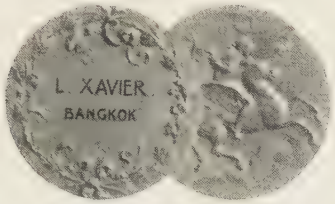
Turin International Exhibition, 1911.

Awarded a

GOLD 

MEDAL

for their

White and Granulated Rice.

L. XAVIER,

Rice and Granulating Mills.

Proprietor : **PHYA PHIPAT KOSA (Xavier).**

OFFICE ADDRESS :

L. Xavier Rice Mill,
Klong Kut Mai, BANGKOK.

Telegraphic Address : **'REIVAX.'**

BUSINESS: Exporter of all kinds of Rice, Meal, and Granulated Rice for Brewing Purposes, Starch, etc., etc. Having always on hand Landed Properties, Dwelling-houses, Offices, and Godowns, to let and for sale.

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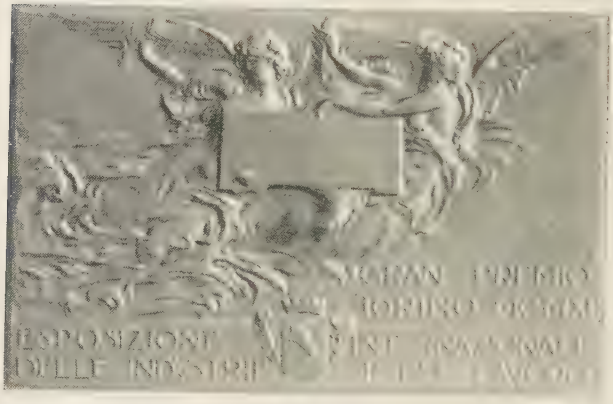
Photographs of the Official Shields of Honour.



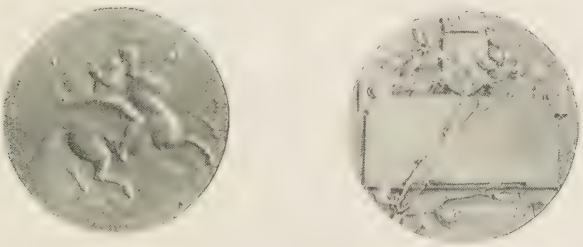
GRAND PRIX SHIELD.

DIPLÔME D'HONNEUR SHIELD.

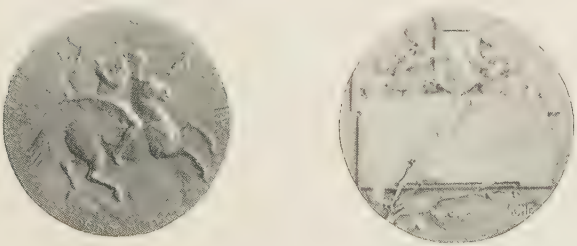
Turin International Exhibition, 1911.

Photographs of the Official Prize Medals.

PRIZE MEDAL.



MERIT MEDAL.



COLLABORATION MEDAL.